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ORIGINAL RESEARCH

Toxicology

Trends in cannabis use in New Jersey: Effects of COVID-19 and cannabis legalization

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Abstract

Objectives: With the legalization of cannabis in New Jersey on April 21, 2022, including the licensing of cannabis dispensaries, concerns have arisen about potential adverse events related to cannabis use. Here, we explore temporal trends and risk factors for cannabis-related harm in both adult and pediatric cannabis-related visits at a tertiary care academic institution.

Methods: We performed a retrospective chart review and temporal trend analysis via the electronic health record from May 1, 2019 to October 31, 2022, covering 2 years before, and 6 months after, cannabis legalization in New Jersey. The pediatric charts identified were analyzed for root causes of adverse events, and changes in the frequency of specific unsafe practices since cannabis legalization were tracked.

Results: We found that adult cannabis ED-related visits significantly increased during the COVID-19 pandemic and remained higher than pre-pandemic levels for the remainder of the study periods, without a significant change upon legalization. Pediatric rates of cannabis-related ED visits did not vary significantly during the study period. The vast majority of visits for children aged 0–12 years were related to acci-

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dental cannabis exposures—often a household member's edibles—whereas most visits for older children stemmed from intentional cannabis use.

Conclusion: This project highlights the unintended consequences of wider cannabis access in New Jersey. Notably, cannabis use increased even before its legalization, presumably in response to the COVID-19 pandemic and its attendant mental health effects. Rates of cannabis use disorder and its highlight of other concurrent psychiatric disorders are important topics for both clinicians and lawmakers to consider.

KEYWORDS
cannabis, COVID-19, pediatrics, public health, substance abuse, toxicology

1 | INTRODUCTION

1.1 | Background

On April 21, 2022, recreational cannabis became available for legal purchase in New Jersey by anyone 21 years of age or older,[1] coinciding with a national trend toward state-based legalization which began in 2012 with Colorado and Washington. New Jersey was the first Mid-Atlantic state to legalize cannabis.

Traditionally cannabis products are smoked, vaporized, or ingested. The adverse events associated with cannabis use are often related to its psychotropic effects, which are thought to be mediated largely by delta-9-tetrahydrocannibinol (THC), acting in part through cannabinoid receptor type 1 and cannabinoid receptor type 2.[2,3] Notably, research cannabis available through the National Institutes of Health contained approximately 3%–6% THC, while legal cannabis available for sale may contain 19%–30%.[4] Recently, many ingestible recreational cannabis products have become available. Often these edible cannabis products are made to mimic well-known, non-cannabis products, such as gummies and other forms of candy.[5–7] Packaging laws have banned look-a-like product packaging but illegal product packaging is still a concern.[7] It has been hypothesized that this type of packaging has contributed to rising cases of unintentional cannabis ingestion.[5,7]

1.2 | Importance

Cannabis is generally considered safe for moderate consumption by adults, but there have been numerous public health concerns regarding its post-legalization use.[5,8–11] Although the data are at this time limited, rates of emergency department (ED) visits for cannabis-related complaints have been suggested to increase in parallel to recreational legalization and commercialization.[6,12–14] Some emergent conditions related to cannabis use include respiratory depression, seizures, unintentional and intentional overdose, as well as related conditions such as cannabinoid hyperemesis syndrome.[2,6,12]

1.3 | Goals of this investigation

Public health authorities, including the NJ Poison Information and Education System and the NJ Cannabis Regulatory Commission,[15] have undertaken educational campaigns to promote the safe use of cannabis and prevent cannabis-related harm. Our research aims to augment these efforts by quantifying the rates and root causes of cannabis-related harm so that educational efforts can be targeted to maximal effect. We report temporal trends in both adult and pediatric cannabis-related ED visits at a large, tertiary care, academic institution in Northern New Jersey, extending from the pre-legalization through post-legalization periods in New Jersey. Recent publications have noted an increase in cannabis use[16] and edible cannabis-related pediatric hospital admissions[17] during the COVID-19 pandemic, likely related to the pandemic's negative effects on mental health. We therefore also examine the effects of the COVID-19 pandemic on cannabis-related ED visits in our study population.

2 | METHODS

2.1 | Study design, setting, and participants

Data were obtained from Hackensack Meridian Health in Hackensack, NJ. Our study design was a retrospective chart review, conducted using electronic health record (EHR) data from the pediatric and adult EDs, which see over 120,000 patients annually. The hospital serves a large and diverse patient population, spanning multiple cultural, ethnic, and socioeconomic strata. The time period of the EHRs reviewed was from May 1, 2019 through October 31, 2022. This time period covers the 2 years prior to cannabis legalization in NJ, including the COVID-19 pandemic and its attendant mental health effects, as well as the first 6 months after cannabis legalization in the state. All patients presenting to the ED for a cannabis-related adverse event were included in this study.

2.2 | Procedure and measurements

Our initial extraction of ED charts was based on cannabis-related ICD-10 codes listed in the ED Diagnosis for each ED encounter (see Supporting Information). This yielded a list of ED encounters that included the following data points:

- Medical record number (MRN).
- Date of encounter.
- Age (to allow for separation of risk factors by pediatric vs. adult patients).
- ED diagnosis.

The list of cannabis-related ED encounters was then used to calculate changes in the frequency of cannabis-related ED visits pre- versus post-legalization, as well as pre-COVID-19, post-COVID-19, and during the COVID-19 pandemic. In order to identify risk factors that led to cannabis-related harm, we randomly sampled a subset of these charts (10%) for manual review. The manual review was conducted by seven of the study authors. Additionally, an initial subset of four records were reviewed independently by the authors and discussed as a group to ensure consistency in the subsequent manual review. The list of variables for extraction were decided upon through consensus. This list included:

- accidental or intentional ingestion
- product possession
- prior cannabis use
- type of product (edible or not)
- product source
- candy mimic (an edible designed to look like candy or other "junk food")
- improper storage (placed in an area where it was likely to be found by others and/or mistaken for a non-cannabis product, ie, cannabis-containing chocolate bar kept in a pantry with regular chocolate bars)
- THC dosage

This study was approved by the Hackensack Meridian Health Institutional Review Board.

2.3 | Data analysis

Multiple approaches to assess trends in cannabis-related harm were used. Descriptive statistics were applied to characterize our sample and are presented as percentages. Rates were estimated as binomial proportions multiplied by 100,000. Note that 95% confidence intervals were computed with Wilson's method. To compare counts of cannabis-related visits, rather than analyzing repeated visits by the same subjects, a pre-post χ^2 test was employed. The pre-post χ^2 test was conducted to assess whether there was a statistically significant difference in the proportion of ED visits per age group that were cannabis-related before and after the passage of cannabis-related legislation. Pediatric and adult proportions were compared with Pearson's χ^2 test for two independent proportions. To understand the most common risk factors for cannabis-related harm, we extracted risk factors from the EHR and their frequency, which was then analyzed with descriptive statistics.

The Bottom Line

Legalization of cannabis use may be associated with increased cannabis-related adverse events. In this retrospective analysis of emergency department (ED) visits before and after cannabis legalization in New Jersey, adult cannabis ED-related visits significantly increased during the COVID-19 pandemic, while pediatric cannabis-related ED visits did not change. ED visits for children ages 0–12 years were more likely related to accidental cannabis exposures, whiles visits for older children stemmed from intentional cannabis use. These results highlight the unintended consequences of wider cannabis access in New Jersey.

TABLE 1 Percentage of emergency department (ED) visits that were cannabis related.

Population	Rates of cannabis-related visits per 100,000 ED visits
Overall	91 (82–100)
Adult	60 (52–70)
Pediatric	163 (141–188)

Note: The rates of cannabis-related visits per 10,000 visits along with 95% confidence intervals. Pediatric and adult rates of cannabis-related visits were statistically different (163 vs. 60, $p = 0.000$).

3 | RESULTS

There were 396,410 ED visits during the study period, with 279,445 adult and 116,965 pediatric visits. Of these, 357 (167 adult; 190 pediatric) were cannabis related. These translate to a rate of 91 cannabis-related visits per 100,000 for the overall population, 60 for the adult population, and 163 for the pediatric population (Table 1). Pediatric and adult rates of cannabis-related visits were different (163 vs. 60, $p = 0.000$).

We found that adult (age 22+) cannabis ED-related visits significantly increased after the start of the COVID-19 pandemic, and they remained higher than pre-pandemic levels for the remainder of the study periods ($p < 0.0001$ for both incident rates of cannabis-related ED visits and proportion of total ED visits that were cannabis related). However, there was no significant change between the pandemic levels and the post-legalization period. Our findings are summarized in Table 2 and Figure 1.

TABLE 2 Cannabis-related visits by period and age.

Study periods	Total ED visits	Count of cannabis-related ED visits [rate (95% CI)]			
		Age 0–12 years	Age 13–21 years	Age 22+ years	Overall
5/1/19–2/29/20 (pre-COVID-19 and illegal)	104,858	1 [1 (1–6)]	33 [32 (23–45)]	15 [15 (9–24)]	49 [47 (36–62)]
3/1/20–2/28/22 (COVID-19 and illegal)	201,476	13 [7 (4–12)]	102 [51 (42–62)]	105 [53 (44–64)]	220 [110 (96–125)]
3/1/22–4/20/22 (post-COVID-19 and illegal)	17,313	1 [6 (2–33)]	9 [52 (28–99)]	11 [64 (36–114)]	21 [122 (80–186)]
4/21/22–10/31/22 (post-COVID-19 and legal)	72,763	4 [6 (3–15)]	27 [38 (26–54)]	36 [50 (36–69)]	67 [93 (73–117)]
Overall	396,410	19 [5 (3–7)]	171 [43 (37–50)]	167 [42 (36–49)]	357 [91 (82–100)]

Note: The counts and rates of cannabis-related visits per time period. The rate is the number of cannabis-related visits per 100,000 ED visits. Confidence intervals are Wilson confidence intervals. Recreational cannabis use for adults aged 18 and over was legalized in New Jersey on April 21, 2022.
Abbreviations: CI, confidence interval; ED, emergency department.

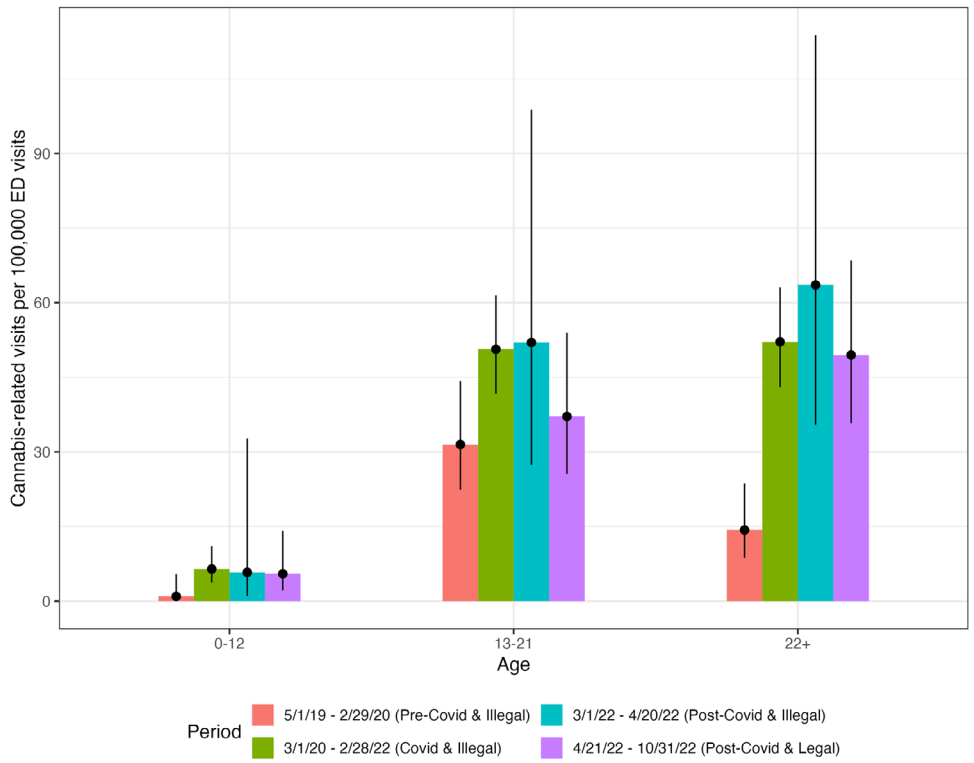

FIGURE 1 Rates of emergency department (ED) visits that were cannabis-related by age group and time period. The rate of total ED (both adult and pediatric) visits that were cannabis related during the study period is shown for each age group (pediatrics: 0–12 years old and 13–21 years old; adults: 22+ years old). Colored categories correspond to distinct time periods analyzed in relation to the time of the COVID-19 pandemic and the date of legalization of cannabis in New Jersey. Pre-COVID-19 and illegal, 5/1/2019–2/29/2020 (red); COVID-19 and illegal, 3/1/2020–2/28/2022 (green); post-COVID-19 and illegal, 3/1/2022–4/20/22 (blue); post-COVID-19 and legal, 4/21/2022–10/31/2022 (purple).

Pediatric rates of cannabis-related ED visits did not vary significantly during the study period (Table 2 and Figure 1). The vast majority of visits for children aged 0–12 years were related to accidental cannabis exposures (73.7%), whereas most visits for older children stemmed from intentional cannabis use (82.5% and 84.4% intentional use in the 13–21 and 22+ categories, respectively, $p < 0.0012$ when comparing age groups) (Table 3). In fact, the risk of accidental ingestion for 0—12 was 25.2 times the risk of accidental ingestion in the 13–21 cohort.

Approximately three-fourths of the visits in the younger group were due to cannabis edibles, which in most cases involved ingestion of a household member's product. The distribution of genders across age categories was not different (F: 47.4%, 46.8%, and 44.9%; $p = 0.931$).

Information related to intentional versus accidental ingestion, source of the product, and prior cannabis use (Table 3) were found most often in the clinical notes section of the EHR. Specifically, admittance to daily prior cannabis use was relatively low among adults (16.4%), but the majority of charts reviewed did not clearly identify the details sur-

TABLE 3 Summary of risk factors by age.

Characteristic	Overall, N = 357	Age 0–12 years N = 19	Age 13–21 years, N = 171	Age 22+ years, N = 167	*p*-value
Gender, *n* (%)					0.931[a]
Female	164 (45.9%)	9 (47.4%)	80 (46.8%)	75 (44.9%)	
Male	193 (54.1%)	10 (52.6%)	91 (53.2%)	92 (55.1%)	
Ingestion, *n* (%)					<0.0012[b]
Unknown	38 (10.6%)	2 (10.5%)	25 (14.6%)	11 (6.6%)	
Accidental	34 (9.5%)	14 (73.7%)	5 (2.9%)	15 (9.0%)	
Intentional	285 (79.8%)	3 (15.8%)	141 (82.5%)	141 (84.4%)	
Type of product, *n* (%)					<0.0011[a]
Unknown	99 (27.7%)	4 (21.1%)	57 (33.3%)	38 (22.8%)	
Edible	98 (27.5%)	14 (73.7%)	28 (16.4%)	56 (33.5%)	
Non-edible (inhaled)	160 (44.8%)	1 (5.3%)	86 (50.3%)	73 (43.7%)	
Product source, *n* (%)					0.0432[b]
Unknown or other[c]	350 (98.0%)	17 (89.5%)	167 (97.7%)	166 (99.4%)	
Homemade by other	1 (0.3%)	0 (0.0%)	1 (0.6%)	0 (0.0%)	
Licensed dispensary	5 (1.4%)	2 (10.5%)	2 (1.2%)	1 (0.6%)	
Unregulated/unlicensed retail location	1 (0.3%)	0 (0.0%)	1 (0.6%)	0 (0.0%)	
Prior cannabis use, *n* (%)					<0.0012[b]
Unknown	182 (51.0%)	1 (5.3%)	98 (57.3%)	83 (49.7%)	
Daily	51 (14.3%)	0 (0.0%)	24 (14.0%)	27 (16.2%)	
Frequent > 2× per week	43 (12.0%)	0 (0.0%)	24 (14.0%)	19 (11.4%)	
Never	42 (11.8%)	18 (94.7%)	4 (2.3%)	20 (12.0%)	
Occasional < 2× per week	39 (10.9%)	0 (0.0%)	21 (12.3%)	18 (10.8%)	
Candy mimic, *n* (%)					<0.0012[b]
Unknown	128 (35.9%)	4 (21.1%)	70 (40.9%)	54 (32.3%)	
No	173 (48.5%)	3 (15.8%)	87 (50.9%)	83 (49.7%)	
Yes	56 (15.7%)	12 (63.2%)	14 (8.2%)	30 (18.0%)	
Improper storage, *n* (%)					<0.0012[b]
Unknown	97 (27.2%)	5 (26.3%)	55 (32.2%)	37 (22.2%)	
No	249 (69.7%)	5 (26.3%)	116 (67.8%)	128 (76.6%)	
Yes	11 (3.1%)	9 (47.4%)	0 (0.0%)	2 (1.2%)	

[a]Pearson's chi-squared test.
[b]Fisher's exact test for count data with simulated *p*-value (based on 2000 replicates).
[c]Unknown/other can be a result of incomplete charting or a patient having both.

rounding any prior cannabis use before the hospital encounter one way or the other. In fact, manual chart review found that the clinical notes were too often lacking in information regarding the type of product, if the product mimicked candy, and how the product was stored. In addition, how the product was obtained, and specific dosage information was not found in clinical notes often enough to adequately report on these findings.

Among cases where data were available, there were many differences between the younger cohort of patients (0–12) and the older patients: In the 0–12 category, cannabis-related cases mostly involved an edible product (73.7%), in contrast to 13–21 and 22+ categories, in which cannabis-related cases often involved non-edible products (50.3% and 43.7%; $p < 0.0011$). Additionally, in the 0–12 age group, most cases involved patients who never used cannabis products before: 94.7% compared to 2.3% in the 13–21 and 12% in the 22+ age groups ($p < 0.0012$). In the youngest age group, cannabis-related cases mostly involved a product that mimicked candy (63.2%), in contrast to the 13–21 and 22+ categories, in which products mimicking candy were reported only 8.2% and 18.0% of the time ($p < 0.0012$). The risk of a candy mimic for the 0–12 age group was 7.7 times the risk of candy mimic in the 13–21 cohort, and 3.5 times the risk of candy mimic in the adult cohort. Finally, among 0–12 year olds, improper storage of the cannabis product was noted in 47.4% compared to 0.0% and 1.2% of cases in the older patients ($p < 0.0012$).

The distribution of the product source did not differ between the age groups ($p = 0.0432$). Most cannabis-related cases in each age category involved an "unknown" or "other" source (89.5%, 97.7%, and 99.4%). However, note that licensed dispensary products were involved in 10.5%, 1.2%, and 0.6% of cases for the respective age categories.

4 | LIMITATIONS

Our results are based on a relatively small clinical population from one hospital within a larger hospital network in New Jersey. A larger sample could have revealed additional statistically significant differences in cannabis-related ED visits, including among children. In addition, since the study is conducted within a single academic medical center utilizing the Epic EHR, there is a risk of limited generalizability of our results. Additionally, using ICD-10 codes to identify cannabis-related visits may inadvertently exclude visits that were cannabis-related but not coded as such in the medical record. Our study was also limited by the paucity of chart documentation related to specific risk factors contributing to cannabis-related adverse events; this limitation may be overcome in future prospective studies that obtain this information in real time. It may also be illuminating to study the reasons providers did not record these details a priori.

5 | DISCUSSION

We wished to explore changes in trends and risk factors for cannabis-related harm in New Jersey since its legalization for adult recreational use, and our results indicate that it was not the legalization period, but rather the COVID-19 pandemic period that appeared to have greater influence over the increased incidence of cannabis-related ED visits during this time. We can easily speculate that this was a result of pandemic-related increases in anxiety, depression, and other mental health concerns that was noted worldwide.[18] With decreased access to their usual mental health resources, many patients likely turned toward cannabis's psychotropic effects as "self-medication." Future studies may demonstrate whether individuals who initiated cannabis use in response to pandemic-related anxiety or depression are at increased risk of developing chronic mental health illness in the future.

While our study did not examine the effects of the social determinants of health on rates of cannabis-related ED visits, the increase noted during the COVID-19 pandemic suggests this is an important avenue for future research. In particular, it would be enlightening to determine whether specific comorbid mental health diagnoses or socio-demographic factors such as income, neighborhood advantage/deprivation, or ethnicity correlated with cannabis use or cannabis-related harm.

In contrast to recent studies in the United States and Canada,[4–6,17] we did not note an increase in pediatric cannabis-related visits during our study period. However, our findings highlight that the vast majority of patients within the 0–12 age range required medical care due to an accidental overdose of a household member's product. Furthermore, calls to poison control centers about accidental cannabis ingestion have increased,[4,17] especially in states where cannabis is legal.[8] Candy and gummy edibles are often packaged in a fashion similar to popular snacks, likely contributing to their accidental ingestion by children. Younger children are especially at risk, and the U.S. Food and Drug Administration (FDA) recommends keeping Delta-8 THC products out of reach of children and pets.[19]

As part of its ongoing monitoring of health-related advertising claims, in July 2023, the FTC, jointly with the FDA, sent cease and desist letters to several companies currently marketing edible products containing Delta-8 THC. The FTC determined that their advertising may violate Section 5 of the Federal Trade Commission Act, which prohibits unfair or deceptive acts in or affecting commerce, including practices that present unwarranted health or safety risks.[20]

Nonetheless, as NJ became the first mid-Atlantic state to legalize adult recreational cannabis use, this project highlights unintended consequences of wider cannabis access in this state, especially in the context of pandemic-related mental health stressors. It is also likely that easy access to cannabis in NJ will impact neighboring states as a multitude of interstate highways and public transit options make it trivial for their residents to travel here to purchase cannabis-containing products. Future national studies may illuminate the impact of cannabis legalization in one state on cannabis-related harm in nearby, easily commutable, locales where cannabis is not yet legal. With the current substance abuse and mental health epidemics plaguing the United States, rates of cannabis use disorder and its highlight of other concurrent psychiatric disorders are essential topics for both clinicians and lawmakers to consider.

It is our hope that our findings may help guide future policies, particularly in the branding and labeling of cannabis edibles. In general, we hope our results may help guide public health practices that facilitate safe cannabis use while preventing cannabis-related harm.

AUTHOR CONTRIBUTIONS

John P. Kane, Andrew Ames, and Raj V. Patel contributed to study conceptualization, data collection, critical review and evaluation of results, and manuscript preparation. Roland Narine contributed to data collection, critical review and evaluation of results, and review and editing of the paper. Kaitlyn Voity contributed to data collection, critical review and evaluation of results, and manuscript preparation. Rimma Perotte contributed to study conceptualization, data collection, data analysis, critical review and evaluation of results, manuscript preparation, and study supervision. Simon Gelman contributed to the statistical analyses and evaluation of the results as well as editing of the final manuscript. Diana McCarthy contributed to manuscript authorship, review, and editing. Sondra Maureen Nemetski contributed to study conceptualization, data collection, critical review and evaluation of results, manuscript preparation, and study supervision.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interset.

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REFERENCES

1. State of NJ—Office of the Governor. Governor Murphy marks historic opening day of adult-use recreational cannabis sales in New Jersey. 2022. Accessed November 17, 2023. https://www.nj.gov/governor/news/news/562022/20220421a.shtml
2. Guidet C, Gregoire M, Le Dreau A, et al. Cannabis intoxication after accidental ingestion in infants: urine and plasma concentrations of Δ-9-tetrahydrocannabinol (THC), THC-COOH and 11-OH-THC in 10 patients. *Clin Toxicol*. 2020;58(5):421-423. doi:10.1080/15563650.2019.1655569
3. Borgelt LM, Franson KL, Nussbaum AM, et al. The pharmacologic and clinical effects of medical cannabis. *Pharmacotherapy*. 2013;33(2):195-209. doi:10.1002/phar.1187
4. Wang GS, Le Lait MC, Deakyne SJ, et al. Unintentional pediatric exposures to marijuana in Colorado, 2009–2015. *JAMA Pediatr*. 2016;170(9):e160971. doi:10.1001/jamapediatrics.2016.0971
5. Lin A, O'Connor M, Behnam R, et al. Edible marijuana products and potential risks for pediatric populations. *Curr Opin Pediatr*. 2022;34(3):279-287. doi:10.1097/MOP.0000000000001132
6. Myran DT, Cantor N, Finkelstein Y, et al. Unintentional pediatric cannabis exposures after legalization of recreational cannabis in Canada. *JAMA Netw Open*. 2022;5(1):e2142521. doi:10.1001/jamanetworkopen.2021.42521
7. Davis M. Marijuana that looks like candy? NJ panel urged to make sure kids are kept away from weed. 2021. Accessed November 17, 2023. https://www.app.com/story/news/local/new-jersey/marijuana/2021/07/14/nj-legal-marijuana-packaging-children/7951880002/
8. Renfrow J. Calls to poison control double after medical marijuana legalized in Massachusetts. Fierce Healthcare. 2019. Accessed November 17, 2023. https://www.fiercehealthcare.com/regulatory/calls-to-poison-control-double-after-medical-marijuana-legalized-massachusetts
9. Lisi DM. Cannabis edibles and pediatric toxicity risk. *US Pharm*. 2022;47(8):HS-2-HS-11. Accessed October 19, 2022. https://www.uspharmacist.com/article/cannabis-edibles-and-pediatric-toxicity-risk
10. Roth W, Tam M, Bi C, et al. Changes in California cannabis exposures following recreational legalization and the COVID-19 pandemic. *Clin Toxicol (Phila)*. 2022;60(5):632-638. doi:10.1080/15563650.2021.2006212
11. Roberts BA. Legalized cannabis in Colorado emergency departments: a cautionary review of negative health and safety effects. *West J Emerg Med*. 2019;20(4):557-572. doi:10.5811/westjem.2019.4.39935
12. Kim HS, Monte AA. Colorado cannabis legalization and its effect on emergency care. *Ann Emerg Med*. 2016;68(1):71-75. doi:10.1016/j.annemergmed.2016.01.004
13. Tolan NV, Terebo T, Chai PR, et al. Impact of marijuana legalization on cannabis-related visits to the emergency department. *Clin Toxicol (Phila)*. 2022;60(5):585-595. doi:10.1080/15563650.2021.2012576
14. Whitehill JM, Harrington C, Lang CJ, et al. Incidence of pediatric cannabis exposure among children and teenagers aged 0 to 19 years before and after medical marijuana legalization in Massachusetts. *JAMA Netw Open*. 2019;2(8):e199456. doi:10.1001/jamanetworkopen.2019.9456
15. Cannabis Regulatory Commission. Safe and responsible consumption. Accessed November 17, 2023. https://www.nj.gov/cannabis/adult-personal/safe-responsible-consumption/
16. Mehra K, Rup J, Wiese JL, Watson TM, et al. Changes in self-reported cannabis use during the COVID-19 pandemic: a scoping review. *BMC Public Health*. 2023;23:2139. doi:10.1186/s12889-023-17068-7
17. Tweet MS, Nemanich A, Wahl M. Pediatric edible cannabis exposures and acute toxicity: 2017–2021. *Pediatrics*. 2023:e2022057761. doi:10.1542/peds.2022-057761
18. Meherali S, Punjani N, Louie-Poon S, et al. Mental health of children and adolescents amidst COVID-19 and past pandemics: a rapid systematic review. *Int J Environ Res Public Health*. 2021;18(7):3432. doi:10.3390/ijerph18073432
19. Tresser C. Government warns sellers of edible cannabis: stop using packaging that mimics foods popular with kids. Federal Trade Commission Consumer Advice. 2023. Accessed November 17, 2023. https://consumer.ftc.gov/consumer-alerts/2023/07/government-warns-sellers-edible-cannabis-stop-using-packaging-mimics-foods-popular-kids
20. Federal Trade Commission. FTC sends cease and desist letters with FDA to companies selling edible products containing delta-8 THC in packaging nearly identical to food children eat. 2023. Accessed November 17, 2023. https://www.ftc.gov/news-events/news/press-releases/2023/07/ftc-sends-cease-desist-letters-fda-companies-selling-edible-products-containing-delta-8-thc

SUPPORTING INFORMATION

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

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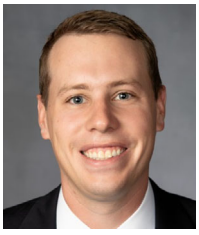
AUTHOR BIOGRAPHY



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