

Unraveling the High: Examining Characteristics and Outcomes of Patients with Acute Cannabis Toxicity

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Background: On November 6, 2018, 56% of Michigan voters approved Proposition 1, making Michigan the first state in the Midwest to legalize cannabis. Currently, about one in nine Michigan residents (11.6%) reports past-month cannabis use. The growing availability and public acceptance of cannabis in Michigan has led to a marked increase in emergency department (ED) visits.

Objectives: Our purpose was to analyze the clinical characteristics and outcomes of patients presenting to the ED following recreational cannabis use. Patients admitted to the hospital were compared to those treated in the ED and released.

Methods: This was a retrospective cohort analysis of consecutive patients diagnosed with toxicity related to cannabis use. Patients were seen at eight EDs over a 36-month study period (November 2018-October 2021). Spanning 13 counties in Michigan, affiliated institutions included three rural medical centers, three university-affiliated hospitals, and a children's tertiary care facility. Data included demographics, clinical features, and treatment outcomes in cannabis patients admitted to the hospital from the ED versus those treated and released. Chi-squared and t-tests were used to compare these cohorts across key demographic and clinical variables.

Results: During the study period, 1435 patients were evaluated for cannabis toxicity; 1256 (87.5%) were treated and discharged from the ED, 120 (8.4%) were hospitalized, and 59 (4.1%) were transferred to a psychiatric facility. The majority (65.4%) of children less than 12 years of age were admitted for accidental ingestions of cannabis. In comparison, adolescents (ages 12-19) and adults (> 19 years) had similar rates of hospital admission (6.4% versus 7.3%, respectively; $p=0.61$). Adolescents and young adults had a higher frequency of psychiatric chief complaints compared to older adults (25.5% vs. 7.5%, $p<0.001$) and were more likely to be transferred to a psychiatric facility or jail (7.5% vs 1.9%, $p<0.001$). Emergency department patients were significantly more likely to be admitted if they were male, ingested cannabis (e.g., baked goods), presented with cardiovascular or neurological chief complaints, were pregnant, had multiple comorbidities, or had a history of polysubstance abuse. The mean hospital length of stay was 2.3 days (range 1-11 days).

Conclusions: In this community-based ED study, 12.5% of patients with cannabis toxicity were hospitalized or transferred to a psychiatric facility. Because of the widespread use of cannabis in our society, ED clinicians must educate and inform our high-risk patients of the dangers of continued cannabis use.

Keywords: Cannabis toxicity, hospitalization, outcomes, clinical characteristics

INTRODUCTION

Cannabis is the most used illicit drug worldwide, with more than 4% of the global population aged 15-64 using cannabis in 2020¹. Its popularity continues to grow owing to increased legalization, relatively low prices, and the perception that cannabis has less potential for abuse than alcohol and other illicit recreational drugs². In states where cannabis has been legalized, there have been reports of increased emergency department (ED) visits related to cannabis toxicity³. These visits may be due to various reasons, including acute

intoxication, adverse reactions, accidental ingestion by children, or inexperienced users underestimating the potency of marijuana products. Some may seek emergency medical care due to acute psychiatric symptoms triggered by marijuana use. Cannabis can potentially exacerbate underlying mental health conditions or induce temporary psychotic symptoms in susceptible individuals^{4,5}. The non-psychiatric causes of hospitalizations following cannabis toxicity in nationwide studies include neurologic

diseases (primarily cerebrovascular), cardiologic disorders, followed by endocrine, infectious disease, and respiratory disorders^{6,7}. Although acute cannabis toxicity has low mortality, the chronic use of marijuana can cause significant complications. Predictors of hospital mortality in cannabis users are coronary atherosclerosis, congestive heart failure, peripheral vascular disorder, acute myocardial infarction, coagulopathy, chronic obstructive pulmonary disease, renal failure, and metabolic abnormalities⁴. Metabolic abnormalities can include hypoglycemia, hypokalemia, hyponatremia, and metabolic acidosis⁸. Disturbances in the gastrointestinal system, including severe vomiting, are also frequently observed. Individuals experiencing cannabis hyperemesis syndrome encounter repeated occurrences of nausea, abdominal discomfort, and cyclic vomiting³. This syndrome is linked to the habitual and excessive consumption of cannabis daily.

The precise mechanism by which cannabis impacts multiple organ systems is not well understood. However, due to the presence of more than 400 distinct chemicals in cannabis, including 100 diverse cannabinoids, the underlying causes probably involve several different pathways⁹. "Cannabinoid" describes any chemical compound, regardless of its origin or structure, that can attach to the cannabinoid protein receptors found in the body and the brain⁹. Cannabinoid receptors exist in multiple cardiovascular and pulmonary tissues, including endothelium, circulating blood cells, myocardium, vascular smooth muscle cells, respiratory dendritic, and bronchial cells⁹⁻¹¹. Compounds found in cannabis can also impact the autonomic nervous system, which regulates involuntary bodily functions such as heart rate, blood pressure, and lung function. Young children and teenagers, whose brains are still developing, are especially vulnerable to the neuropsychiatric effects of cannabis¹².

Overall, the complex composition of cannabis, distribution of cannabinoid receptors, interaction with the endocannabinoid system, pathway-specific effects, and modulation of the autonomic nervous system contribute to the widespread influence of cannabis on multiple organs in the body^{13,14}. Complicating the issue of cannabis toxicity, legally sold cannabis may also contain heavy metals (lead, arsenic), microbes, pesticides, and foreign matter¹⁵. These contaminants are not regulated and can affect the pharmacokinetics of cannabinoids, potentially altering their clinical characteristics and leading to adverse effects^{16,17}.

Among states in the Midwest, Michigan was the first to legalize recreational marijuana, which occurred in 2018. With the approval of recreational marijuana increasing among states, there is now a renewed sense of urgency to investigate its effects and determine the causes behind unpredictable hospital admissions among cannabis users^{18,19}. This community-based study aimed to analyze the clinical characteristics and outcomes of ED patients hospitalized following recreational cannabis use. Specifically, we will address the following research questions: 1) What demographic factors are associated with different rates of hospital admission and disposition outcomes for patients evaluated for cannabis toxicity? 2) How do the rates of psychiatric chief complaints among adolescents and young adults compare to those of older adults, and what factors contribute to these differences? 3) What were the most frequent causes of hospitalizations in ED patients with cannabis toxicity?

METHODS

Study Design/Setting: We conducted a retrospective cohort analysis of all patients evaluated with cannabis toxicity. Patients were evaluated at eight EDs over a 36-month study period. Spanning 13 counties in West Michigan, affiliated institutions included four rural medical centers, two community hospitals, one university-affiliated hospital, and a children's tertiary care facility.

Study population: All ED patients seen at participating hospitals from November 2018 to October 2021 with acute cannabis-related disorders/poisoning. If a patient had more than one visit to any hospital during the study period, all visits were included for review. Patients were identified using the data acquisition services of our institution's research scientific support team with the following ICD-10 codes used in the primary diagnostic field: F12 (cannabis-related disorders) or T40.7 (cannabis poisoning). Patients were excluded if their documentation was incomplete or missing.

Data collection: The research staff consisted of medical students trained in data abstraction using a set of simulated electronic medical records. Data was collected using a standardized abstraction form. One investigator oversaw data abstraction and confirmed that data variable definitions were uniformly applied. All investigators evaluated any questionable records to reach a consensus and assign a code. Data included demographics, clinical features, and treatment outcomes in cannabis patients admitted to the hospital from

the ED versus those discharged to home. For the purposes of this study, cannabis intoxication was defined as “perception alterations, mild motor impairment, euphoria, and intensification of ordinary sensory experiences”⁵. Cannabis toxicity was defined as the harmful effects that can result from the excessive use or consumption of cannabis products, particularly those containing high concentrations of psychoactive compounds such as tetrahydrocannabinol (THC). The cannabinoid hyperemesis syndrome (CHS) was defined by chronic cannabis use, cyclic episodes of nausea and vomiting, and abdominal discomfort, with patients often experiencing relief after bathing in hot water²⁰. Patient ages were categorized as children (<12 years), adolescents (ages 12–19), young adults (ages 20–35), middle-aged (ages 36–55), and older adults (>55 years).

Statistical analysis: The primary outcome of this study was demographic characteristics and clinical features associated with hospitalization of patients with cannabis toxicity. A sample size determination was performed a priori. Approximately 1000 participants were needed to achieve a 95% confidence level that the true value is within $\pm 3\%$ of the measured value²¹. Secondary outcomes were the rates of psychiatric chief complaints among adolescents and adults, and the most frequent causes of hospitalizations in patients with cannabis toxicity. Data was entered into a Microsoft Excel database (Microsoft Corp, Redmond, WA, USA). All analyses were performed using SAS statistical software (SAS Institute, Cary, NC, USA). One investigator performed a blinded critical review of a random sample of 10% of the charts to determine data reliability using kappa statistics. Pearson’s chi-squared, Fisher’s exact test, and one-way ANOVA statistics were used to compare the two study cohorts across important demographic and outcome variables. Chi-square and Fisher’s exact test were used, as appropriate, to compare categorical variables. ANOVA tests were used to compare the means of multiple groups. A P value <0.05 was considered statistically significant. This study was approved by the Institutional Review Board (IRB) at Corewell Health

RESULTS

The During the study period, 1435 patients were evaluated for cannabis toxicity. The frequency of ED visits attributable to cannabis increased each month throughout the 36-month study period. The mean age was 27.0 ± 13.2 years (6 months to 86 years). Overall, 113 (7.9%) were >64 years and 26 (1.8%) were children <12 years of age. A total of 157 patients (10.9%)

arrived by EMS, and 93 required prehospital treatment (naloxone, oxygen). Table 1 lists the final disposition outcomes in our study population. One hundred twenty (8.4%) were subsequently hospitalized, and 59 (4.1%) were transferred to a psychiatric facility. The majority (65.4%) of children less than 12 years of age were admitted for accidental ingestions of cannabis. In comparison, adolescents and adults (> 19 years) had very similar rates of hospital admission (6.4% versus 7.3%, respectively; $p=0.61$).

Table 1. Outcomes in ED Patients Presenting with Cannabis Toxicity (n=1435)

Disposition	n (%)
Discharged to home	1192 (83.1%)
Admitted to hospital	120 (8.4%)
Transferred to psychiatric hospital	59 (4.1%)
Self-discharged (against medical advice)	20 (1.4%)
Homeless Shelter	18 (1.3%)
Jail	15 (1.1%)
Youth home	5 (0.4%)
Extended care facility	4 (0.3%)
Adult Foster home	2 (0.1%)

Tables 2 and 3 compare the clinical features of those treated and released from the ED and those patients who were admitted to the hospital. Emergency department patients were significantly more likely to be admitted if they were male (65.8% vs. 51.3%), ingested cannabis (41.7% vs 16.5%), presented with cardiovascular or neurological chief complaints (37.5% vs. 19.0%), were pregnant (2.5% vs. 0.43%), had multiple comorbidities (38.3% vs 19.3%), or had a history of polysubstance abuse (19.3% vs. 11.7%).

Table 2. Demographics in ED Patients with Cannabis Toxicity

	Hospitalized patients (N=120)	Discharged home (N=1174)	P
Mean age (SD)	27.3 $\pm$ 15.8 yrs	26.9 $\pm$ 12.0 yrs	0.736
Gender (% Male)	79 (65.8%)	602 (51.3%)	0.003
Race (% white)	78 (65.0%)	676 (57.6%)	0.118
Pregnant	3 (2.5%)	5 (0.43%)	0.006
Multiple comorbidities	46 (38.3%)	227 (19.3%)	< 0.001
History polysubstance abuse	23 (19.3%)	137 (11.7%)	0.016

Admitted patients had a longer ED stay (5.2 vs. 3.1 hours). Factors that contributed to this difference included the complexity of the medical condition, time spent arranging a hospital bed, and specialist consultation.

Table 3. Clinical Characteristics Documented in Patients with Cannabis Toxicity

	<i>Hospitalized patients (N=120)</i>	<i>Discharged home (N=1174)</i>	<i>p</i>
Duration of symptoms (hours)	19.5 ± 21.3	14.3 ± 6.1	< 0.001
Edible cannabis	50 (41.7%)	194 (16.5%)	< 0.001
Cardiovascular/neuro complaints	45 (37.5%)	223 (19.0%)	< 0.001
History polysubstance abuse	23 (19.3%)	137 (11.7%)	0.016
ED length of stay (hours)	5.2 ± 3.7	3.1 ± 2.7	< 0.001

During this study, 179 patients (12.5%; 95% CI, 10.8 to 14.3%) were either admitted to the hospital or transferred to a psychiatric facility. Transfer to a psychiatric facility or jail was more likely for adolescents (ages 12-19) and young adults (ages 20-35) when compared to adults over age 35 (7.5% vs 1.9%, $p < 0.001$).

They also had a higher frequency of psychiatric chief complaints (25.5% vs. 7.5%, $p < 0.001$). Among psychiatric conditions, the most prominent diagnosis was acute depression, followed by anxiety, suicidal ideation, substance-related disorders, schizophrenia, and other psychotic disorders (Table 4). Many of these patients (49.7%) had more than one admitting diagnosis.

The most common non-psychiatric causes of hospitalizations were cannabis intoxication (24.0%) and cannabinoid hyperemesis syndrome (16.2%). In addition to these primary complaints, many intoxicated patients had secondary gastrointestinal, neurologic, and cardiovascular issues. Patients with cannabinoid hyperemesis syndrome (CHS) tended to be young (25.8 ± 8.9 years) and predominantly male (78.4%). Twenty additional patients were admitted with intractable nausea and vomiting but did not meet the criteria for cannabinoid hyperemesis syndrome [20]. Many patients with gastrointestinal disorders were at significant risk of severe dehydration, electrolyte disorders, and prerenal failure. In adult age groups, neurotoxicity was a prevalent issue, affecting approximately 13.4% of individuals. Among those aged 55 and above, it was observed in almost half of the cases. The diagnoses encompassed a range of conditions, such as altered mental status, delirium, seizures, ataxia, vertigo, and syncope. Additionally, cardiovascular diagnoses

Table 4. Primary ED Admitting Diagnoses (n=179)^a

<i>Category</i>	<i>n (%)</i>
Psychiatric	59 (33.0%)
• acute depression	17 (9.5%)
• anxiety disorder	15 (8.4%)
• suicidal ideation	12 (6.7%)
• substance-related disorder	11 (6.2%)
• schizophrenia	5 (2.8%)
• manic or aggressive behavior	4 (2.2%)
• delusional disorder	3 (1.7%)
• acute psychosis	3 (1.7%)
• homicidal ideation	2 (1.1%)
Gastrointestinal disorders	49 (27.4%)
• cannabinoid hyperemesis syndrome	29 (16.2%)
• intractable nausea and vomiting	20 (11.2%)
• abdominal pain	19 (10.6%)
Cannabis intoxication	43 (24.0%)
Renal disorders	41 (22.9%)
• dehydration	38 (21.2%)
• acid/base	22 (12.3%)
• electrolyte disorders	19 (10.6%)
• acute kidney injury	5 (2.8%)
Neurologic disorders	24 (13.4%)
• altered mental status	15 (8.4%)
• seizures	6 (3.4%)
• delirium	3 (1.7%)
• syncope	3 (1.7%)
Cardiovascular disorders	21 (11.7%)
• palpitations	12 (6.7%)
• tachycardia	7 (3.9%)
• hypertensive urgency	5 (2.8%)
• no-specific chest pain	5 (2.8%)
Accidental drug ingestion	21 (11.7%)
Polysubstance abuse	19 (10.6%)
Suicidal attempt	16 (8.9%)
Pulmonary disorders	4 (2.2%)
• exacerbation COPD	2 (1.1%)
• pneumonia	2 (1.1%)
• pulmonary embolism	1 (0.6%)
Miscellaneous ^b	5 (2.8%)

^a Eighty-nine patients (49.7%) had more than one admitting diagnosis

^b Miscellaneous included hyperglycemia, hypothermic, ataxia, and minor trauma

accounted for about 17.5% of cases and included tachycardia, palpitations, and hypertensive urgency. Thirteen subjects had frequent premature ventricular contractions (PVCs). However, there were no serious ischemic events or

tachyarrhythmias. The mean hospital length of stay was 2.3 days (range 1-11 days). Interrater reliability for data abstraction was excellent, with a median kappa of 0.87.

DISCUSSION

This community-based study helped to establish different primary causes for hospitalization in ED patients evaluated for cannabis toxicity. Our results align with several nationwide studies of hospitalized recreational cannabis users⁶⁻⁹. Desai et al., in a large cross-sectional study, identified cardiovascular and cerebrovascular diseases, in addition to psychiatric illnesses, as the most frequent causes of hospitalization among cannabis users⁶. Among the psychiatric disorders, the most frequent discharge diagnoses included mood disorders, schizophrenia/other psychotic disorders, and substance/alcohol-related disorders. Sulley and colleagues used a nationally representative sample to study cannabis-related hospitalizations⁷. They found the primary reason for hospitalization among a majority of patients was related to mental health, alcohol, HIV, trauma, burns, and the toxic effects of drugs. In addition, emergency admissions are often attributed to suicide and intentional self-inflicted injury⁸. Other research has also demonstrated a correlation between cannabis use and conditions such as depression, psychosis, anxiety, and various substance abuse problems^{8,9}. Several researchers have suggested that the potency or type of cannabis consumed may contribute to an elevated risk of developing psychosis.^{11,12}

Decriminalization, medicalization, and legalization of cannabis use by most U.S. states over the past 25 years have dramatically shifted societal perceptions and use patterns among Americans²². The resulting health consequences include rising cannabis-related motor vehicle accidents, emergency department visits, and hospitalizations. In Colorado, for example, the most concerning effects include the increased risk of schizophrenia or other psychoses, rising suicide rates, and an increase in poisoning and deaths from alcohol, tobacco, and illicit drugs²³. Other significant health effects were increases in fatal motor vehicle collisions, inadvertent pediatric exposures, adverse effects on cardiovascular and pulmonary systems, cannabis contaminants exposing users to infectious agents, heavy metals, and pesticides, and hash-oil burn injuries due to the

preparation of concentrates²³. California saw a 380 percent increase in emergency department visits between 2005 and 2016 for any related cannabis abuse. Cannabis use disorder, overdoses, and accidental ingestion were the driving factors of cannabis-related hospital admissions. Among children, cannabis exposure resulting in hospital admittance increased by more than 513 percent. Cannabis-related exposures of adolescents that resulted in hospital admittance increased by 139 percent during the same time period [24]. Similar changes in marijuana use, ED visits, and hospitalizations were seen post-legalization in Nevada, Washington, Alaska, Michigan, and Oregon²⁴⁻²⁷. Healthcare policy makers may take the adverse outcomes described into consideration when considering if and/or how to legalize cannabis²³.

As cannabis strains become more potent and readily accessible, the risk will increase for the severity and frequency of severe adverse reactions. In our study, risk factors for severe toxicity and subsequent hospitalization included male gender, ingestion of cannabis (edibles or extracts), pregnancy, cardiovascular or neurological chief complaints, or a history of recent polysubstance abuse. Combining cannabis with substances that have sedative or depressant properties can lead to increased impairment, respiratory depression, and cardiovascular risks. Certain medical conditions can also make individuals more vulnerable to cannabis toxicity. Conditions such as cardiovascular disease, respiratory disorders, psychiatric disorders, and neurological conditions can increase the risk of adverse reactions or exacerbate existing symptoms^{28,29}. Admission allows for closer monitoring, appropriate treatment, and timely intervention to ensure patient safety and well-being.

Individuals new to cannabis or who have limited experience with its use are at a higher risk of toxicity. They may be more susceptible to the psychoactive effects of THC, leading to symptoms like anxiety, paranoia, and impaired coordination²⁹. Inexperienced users may also have difficulty dosing accurately, increasing the risk of excessive consumption. Individual variations in metabolism, genetic factors, and overall health can contribute to differences in how individuals respond to cannabis²⁹. For these reasons, a typical toxidrome does not exist for cannabinoid toxicity. Some individuals may be more sensitive to the effects of THC, increasing the likelihood of toxicity even with lower doses.

Children under the age of twelve pose a unique concern. Their smaller body size and developing physiology make them more vulnerable to the effects of THC³. They usually encounter THC unknowingly through the consumption of edible substances, which often contain an unknown amount of THC. As a result, there has been a rise in cases where these children end up in the emergency department, primarily experiencing symptoms of central nervous system depression like drowsiness and fatigue and rarely encountering respiratory insufficiency [30]. Understanding these risk factors can help individuals make informed decisions about cannabis use and promote safer consumption practices (Table 5).

Table 5. Reducing Health Risks When Using Cannabis ^{29,31-34}	
✓	Be sure you trust your source. Legally bought cannabis should be free of heavy metals, pesticides, fungus, and lead.
✓	Steer clear of using cannabis if you're pregnant or breastfeeding.
✓	Avoid cannabis if you or family members have a history of anxiety or other mental health problems.
✓	A person who has serious heart or liver disease should not use cannabis.
✓	Start low and go slow - choose low-potency products and start with a small amount.
✓	Avoid synthetic cannabis products.
✓	Be careful with edibles which have a greater risk of side-effects and over-consumption.
✓	Take shallow puffs, not deep inhalations or prolonged breath-holding
✓	Occasional use (1 day per week) is better than regular use. Frequent use of cannabis can lead to dependence at any age.
✓	Don't drive while impaired. Wait at least 4 hours after using. Cannabis impairment can make other activities such as bicycling dangerous too.
✓	Combining cannabis with alcohol or other drugs makes you more impaired.
✓	Keep medications in their original containers out of reach of children, pets, and unknowing adults.
✓	Initiation of cannabis use should be delayed until after late adolescence or the completion of puberty to reduce development-related harmful effects.
✓	Check the potency of the cannabis product (THC and CBD content).
✓	Use cannabis in a comfortable, safe environment, especially for first-time users. Being in a familiar space can reduce anxiety and promote positive experiences.
✓	Pay attention to how cannabis affects your mood and mental state. Some individuals may experience increased anxiety or paranoia. If this happens, consider reducing use or trying strains with higher CBD content, which may counteract these effects.
✓	Seek help from a health professional if you want to control your cannabis use, if you have withdrawal symptoms or if your use is affecting your life.

In the emergency department, the initial evaluation should be tailored to the patient's symptoms and may involve several tests. These tests may include a metabolic panel to assess renal function, liver function tests, a complete blood count,

and urine and blood drug screens. Assessing troponin levels and creatine kinase can be beneficial when there are concerns about chest pain or suspected rhabdomyolysis. An electrocardiogram (ECG) should be performed to examine abnormal heart rhythms or ischemia. Additionally, if a patient has persistent confusion or an altered mental status without a clear medical history, a head CT scan is often recommended²⁹. Many patients can be observed briefly and discharged home from the ED. Consider inpatient management for patients with psychiatric, cardiovascular effects, focal neurologic symptoms, metabolic abnormalities, or for patients with intractable vomiting not relieved by antiemetics³¹.

The data presented in this study have certain limitations. The retrospective nature of the study and the inability to establish causality restrict the scope of the findings. Moreover, variability in clinical assessment and documentation among healthcare providers introduces inconsistencies in the description of outcome variables. Another factor influencing the data is the subjective nature of drug use reporting, leading to potential response bias. Although the study sample was drawn from thirteen counties in the midwestern United States, it remains uncertain how patient demographics and injury characteristics may differ in other settings. The impact of cannabis on ED visits will vary from state to state due to the availability of cannabis products, specific regulations implemented by each state, and the prevailing healthcare infrastructure.

Although this study documented a monthly increase in ED visits attributable to cannabis over a 36-month period, further research is needed to understand the long-term trends in cannabis toxicity and its implications on public health, particularly after significant policy changes regarding cannabis legalization. Given the varied admission rates and outcomes based on age (particularly in children and older adults), research should delve deeper into age-specific vulnerabilities and the mechanisms behind the increased risk of cannabis toxicity, especially in demographic groups that are less frequently studied (e.g., the elderly). The higher rates of transfer to psychiatric facilities among younger individuals indicate a need for more research on the relationship between cannabis use and psychiatric conditions. Understanding the influence of cannabis on emerging

psychiatric disorders in specific age groups (e.g., adolescents and young adults) could inform mental health strategies. Finally, this study highlights the need for targeted prevention and education efforts, particularly for children, adolescents, and young adults, regarding the risks of cannabis ingestion. Further research could focus on developing effective educational programs and assessing their outcomes.

CONCLUSION

In this retrospective analysis, which examined data from eight EDs in West Michigan, it was discovered that 12.5% of patients who encountered cannabis toxicity needed to be admitted to a hospital or transferred to a psychiatric facility. These hospitalizations are not likely exclusive to only states that have legalized marijuana, and do not seem limited to any specific age group.

By educating high-risk patients about the potential dangers associated with ongoing cannabis use, emergency department clinicians can empower them to make informed decisions, mitigate risks, and take steps to protect their health and well-being. This education plays a crucial role in promoting patient safety and promoting responsible cannabis use. Young patients with acute myocardial infarction, new onset seizures, severe anxiety, or other unexplained symptoms should have a detailed drug history as well as urine screening to detect recent drug use. Finally, more evidence-based research on preventing cannabis-related complications is needed to lessen the economic burden of cannabis-related hospitalizations.

Conflict of interest and funding

The authors declare that they have no conflict of interest, and no funding was provided for this clinical study.

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