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Trends in the association between cannabis use disorder and suicidal ideation in the United States, 2014–2023

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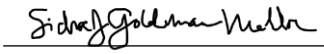

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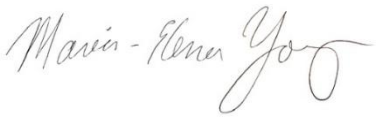

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Abstract

Objective

Amid rising cannabis use, declining perceived harm, and policy liberalization over the past 15 years, we examined whether the association between cannabis use disorder (CUD) and past-year suicidal ideation among U.S. adults changed from 2014–2023 and varied by sex, age, and race/ethnicity.

Method

Using data from 415,861 adults in the 2014–2023 National Surveys on Drug Use and Health, we examined temporal association change between past-year suicidal ideation and CUD (≥2 of 9 harmonized DSM-5 criteria). Logistic regression models, adjusted for demographic, social, clinical, and geographic covariates, tested whether survey year moderated the CUD–suicidal ideation association overall and in strata by sex, age, and race/ethnicity.

Results

Adults with cannabis use disorder had 57% higher odds of past-year suicidal ideation than those without (OR, 1.57; 95% CI, 1.44–1.72) across years. Joint Wald tests showed no evidence that the association changed over time overall ($p = 0.12$) nor within strata defined by sex or age. Although the joint interaction test suggested some variation among Hispanic respondents ($p = 0.01$), no individual year-specific interaction terms remained statistically significant after Bonferroni correction.

Conclusions

Adults with CUD had higher odds of suicidal ideation but, contrary to expectations, the strength of this association remained stable from 2014–2023 and did not differ significantly across sex, age, or racial/ethnic groups despite widespread legalization, increased potency, and shifting norms.

INTRODUCTION

Cannabis use in the United States has increased significantly in the past two decades, particularly among adults. Between 2002 and 2022, past-month cannabis use more than doubled from 6.2% to over 15%, and past-year use reached approximately 25% (Baldwin et al., 2024; Compton et al., 2019). That same year, cannabis use disorder (CUD) was estimated to affect 6% of the U.S. population aged 12 and older, with disproportionately high rates among daily users and those with co-occurring psychiatric conditions (Baldwin et al., 2024; Hasin & Walsh, 2021). Approximately one in five users develop CUD, with highest risk among early initiators, frequent users, and those with pre-existing mental health conditions, adverse childhood experiences, or a family history of substance use disorders (Baldwin et al., 2024; Leung et al., 2020).

Cannabis use, including CUD, has been independently associated with increased odds of suicidal thoughts, plans, and attempts in both sexes, even in the absence of co-occurring depression (Han et al., 2021). Between 2014 and 2023, multiple states implemented recreational cannabis legalization policies, contributing to increased normalization and reduced perceived risk (Nguyen et al., 2024). These changes have coincided with a substantial diversification of cannabis products, including vapes, edibles, and high-potency concentrates that may further elevate risks for mental health problems and suicidality (ElSohly et al., 2021; Nali et al., 2024; Steeger et al., 2021). As cannabis access has expanded, rising rates of CUD and suicidal ideation have been documented in the United States (Han et al., 2021; Hedegaard et al., 2021; Mattingly et al., 2024).

Suicidal ideation and other suicidal behaviors have also sharply increased across specific subgroups defined by sex, age and race/ethnicity categories (Han et al., 2021; Hedegaard et al., 2021). Among adults aged 18–34 years, suicidal ideation rose by 44% for men and 52% for women

from 2008 to 2019 (Han et al., 2021). Evidence suggests that cannabis-related suicide risk may vary across demographic groups due to difference in patterns of cannabis exposure, psychiatric vulnerability, and social context. Prior research has reported stronger associations between cannabis use and suicidality among women (Han et al., 2021). Younger adults also have the highest prevalence of cannabis use and cannabis use disorder, while structural and social determinants shape cannabis exposure and mental health risk differently across racial and ethnic groups (Hasin & Walsh, 2021; Martins et al., 2021). Rising cannabis potency and product diversification may compound these risks, particularly among frequent or vulnerable users (Chan et al., 2024; ElSohly et al., 2016; Forti et al., 2019).

While trends in cannabis use and suicidality separately are well-documented, few studies have examined whether the association *between* CUD and suicidal ideation has changed over time. Prior research by Han et al. (2021) identified rising CUD and suicidality from 2008 to 2019 but did not assess temporal changes in their association (Han et al., 2021). Additionally, research on heterogeneity in this association by age, sex, and race/ethnicity remains limited, leaving uncertainty about how suicide risk patterns linked to CUD may differ across demographic subgroups, particularly over time (Fontanella et al., 2021; Han et al., 2021). Without population-based analyses of whether the CUD–suicidality relationship has changed over time, it remains unclear whether current prevention strategies are adequate. Addressing this gap is essential for informing clinical practice, public health surveillance, and policy responses as cannabis use continues to evolve in the United States (Han et al., 2021; Hasin & Walsh, 2021).

This study aims to address these gaps by using harmonized data from the National Survey on Drug Use and Health (NSDUH) from 2014 to 2023 to analyze whether the association between CUD and suicidal ideation has changed over time in the U.S. We also assessed whether any changes in

this relationship varied across age, sex and racial/ethnic groups. We hypothesized that the strength of this association between CUD and suicidality has increased across survey years and that any temporal changes may vary by age, sex, and race/ethnicity.

METHODOLOGY

Study Design

This study used a repeated cross-sectional design with pooled NSDUH data from 2014–2023. NSDUH is a nationally representative survey of the U.S. civilian, non-institutionalized population aged 12 and older, conducted annually by the Substance Abuse and Mental Health Services Administration (SAMHSA) (Center for Behavioral Health Statistics and Quality, 2023). It monitors trends in substance use, mental health, and service utilization while excluding institutionalized and unsheltered homeless individuals. The original data collection received ethical approval from RTI International, and the data are publicly available (RTI International, 2016). This study was deemed exempt by the University of California, Merced Institutional Review Board. STROBE guidelines were also followed (Vandenbroucke et al., 2007).

Data Source, Sampling, and Collection Methods

Data came from the 2014–2023 NSDUH public-use files. NSDUH uses a stratified, multistage sampling design to generate nationally and state-representative estimates, surveying approximately 56,000 respondents annually, yielding a pooled sample of over 500,000 observations (Center for Behavioral Health Statistics and Quality, 2022, 2023, 2024). Interviews were conducted in person via audio computer-assisted self-interviewing (ACASI) from 2014–2019 (Center for Behavioral Health Statistics and Quality, 2022). The survey transitioned partially online in 2020, with web interviewing as the primary mode in the fourth quarter and in-person

ACASI where feasible (Center for Behavioral Health Statistics and Quality, 2021; Center for Behavioral Health Statistics and Quality, 2022). From 2021–2023, a consistent multimodal (web and in-person) design was used (Center for Behavioral Health Statistics and Quality, 2022, 2023, 2024). This transition introduced mode effects that may influence responses to sensitive items such as suicidal ideation and substance use (Center for Behavioral Health Statistics and Quality, 2024). However, prior sensitivity analyses found no meaningful differences in prevalence estimates between web-based and in-person interviews (Na et al., 2022). While SAMHSA cautions that estimates from 2020 onward may not be strictly comparable with earlier years due to changes in sampling design and data collection methods (Center for Behavioral Health Statistics and Quality, 2022, 2023, 2024), this evidence supports pooling data across years. Accordingly, data from 2014–2023 were pooled and interpreted with appropriate caution. For the purpose of this study, we restricted the analytic sample to adults aged 18 years or older with non-missing exposure and outcome data.

Measures

Primary Exposure: Cannabis Use Disorder (CUD)

CUD was assessed based on nine criteria compatible with the Diagnostic and Statistical Manual of Mental Illnesses-Fifth Edition (DSM-5), available in NSDUH substance use modules, harmonized across 2014–2023 to account for variable changes post-2020 (American Psychiatric Association, 2013; Center for Behavioral Health Statistics and Quality, 2024; Compton et al., 2019). Participants responded “Yes” or “No” to items reflecting: (1) using cannabis in larger amounts or over a longer period than intended; (2) persistent desire or unsuccessful efforts to cut down or control cannabis use; (3) spending a great deal of time obtaining, using, or recovering

from cannabis; (4) cannabis tolerance; (5) giving up or reducing important activities because of cannabis use; (6) continued cannabis use despite physical or psychological problems caused or worsened by use; (7) using cannabis in hazardous situations; (8) continued cannabis use despite social or interpersonal problems; and (9) failure to fulfill major role obligations due to cannabis use (Center for Behavioral Health Statistics and Quality, 2024; Compton et al., 2019).

We excluded the DSM-4 criterion about legal problems because DSM-5 excluded it (American Psychiatric Association, 2013), and we could not assess DSM-5 criteria for cannabis craving and withdrawal symptoms(American Psychiatric Association, 2013; Compton et al., 2019; Gorelick et al., 2012), because the 2014–2020 NSDUH did not collect these consistently. This diagnostic approach may underestimate DSM-5 CUD prevalence (Compton et al., 2019).

Consistent with DSM-5 and prior epidemiological studies (Compton et al., 2019; Fink et al., 2022), past-year CUD was defined as endorsement of two or more of the nine available criteria. Our analyses used the binary variable (CUD present vs. absent, based on the ≥2 threshold).

Because DSM-5 CUD criteria could not be fully harmonized across survey years, we conducted a sensitivity analysis using past-year cannabis use frequency as an alternative exposure measure (no use, nondaily use [<300 days], daily/near-daily use [≥300 days]) (Han et al., 2021).

Outcome Variable: Suicidal Ideation

Suicidal ideation was measured using the NSDUH item: “During the past 12 months, have you seriously thought about trying to kill yourself?” The question is part of the adult mental health module and was asked of all respondents aged 18 years and older. Responses were coded as “Yes” or “No”. Individuals with invalid or missing responses (don’t know, refused and blank) were excluded from analysis (Center for Behavioral Health Statistics and Quality, 2024). The outcome

was analyzed as a binary variable, consistent with prior studies (Han et al., 2021; Mattingly et al., 2024).

Covariates

Covariates were selected based on theoretical and empirical relevance to substance use and suicidality. Sociodemographic variables included age group (18–25, 26-34, 35–49, ≥50 years), sex (male, female), and race/ethnicity (recoded as non-Hispanic White, non-Hispanic Black, Hispanic, and non-Hispanic Other, including Native American/Alaska Native, Asian, Native Hawaiian/Pacific Islander, and multiple race) (Han et al., 2021; Kelly et al., 2021a; Montgomery et al., 2022). Other covariates included education level (less than high school, high school, some college, college graduate or above) (Han et al., 2021), household income (<$20,000; $20,000–$49,999; $50,000–$74,999; ≥$75,000) (Han et al., 2021), and health insurance status (private only, public only, uninsured, multiple, other) (Walker et al., 2015). Self-rated health was categorized as excellent, very good, good, or fair/poor (Conwell et al., 2002; DeSalvo et al., 2006). Multimorbidity was defined as the number of self-reported physician-diagnosed chronic conditions (e.g., diabetes, hypertension, asthma, stroke, heart disease) and categorized as none, one, two, or ≥3 (Harrison et al., 2014).

Religious attendance was dichotomized as <25 times vs. ≥25 times per year (less than weekly vs. weekly or more), consistent with prior NSDUH-based categorizations (Harris et al., 2006; Park et al., 2023). Whether respondents lived in a state with legalized access to medical marijuana was included as a binary variable (legalized vs. not legalized) based on the policy in effect at the time of the survey (Center for Behavioral Health Statistics and Quality, 2024; Compton et al., 2017).

Psychiatric indicators included past-year serious psychological distress (Gray et al., 2023) and past-year major depressive episode (MDE) (Han et al., 2021). Alcohol use disorder (AUD) was defined as meeting DSM-5 criteria, consistent across all years (Bailey et al., 2025).

Statistical Analysis

All analyses, including descriptive and inferential, used NSDUH's year-specific analysis weights with design-adjusted standard errors (strata and primary sampling units). We presented survey-weighted descriptive statistics by year-specific estimates.

To examine whether the association between CUD and past-year suicidal ideation changed over time, we fit a pooled, survey-weighted multivariable logistic-regression model across all years (2014–2023), including year as a categorical variable with 2014 as the reference. Interaction terms (CUD × year) were included to estimate changes in the association between CUD and suicidal ideation over time. The overall significance of the interaction terms were evaluated in each model using a joint Wald test.

We estimated crude and adjusted odds ratios (ORs) with 95% confidence intervals (CIs) and controlled for sex, age group, race/ethnicity, education, household income, health-insurance status, self-rated health, multimorbidity, religious attendance, AUD, psychological distress, MDE, and state marijuana-legalization status. Potential mode-related differences and data-collection changes described in Section 3.2 were considered when interpreting results.

Lastly, we conducted sex-stratified, age-stratified, and race/ethnicity-stratified analyses to assess whether the relationship between CUD and suicidal ideation differed across subgroups and whether temporal associations varied within each subgroup. To account for multiple testing across

22 models, we used a Bonferroni correction to control the family-wise error rate at 0.05 ($\alpha_{\text{per-test (PT)}} = 0.05/22 \approx 0.00227$). Accordingly, we considered p-values less than 0.00227 as statistically significant. All analyses were conducted using Stata statistical software version 18.5 (StataCorp).

RESULTS

Sample Characteristics

From 544,740 respondents, we excluded participants younger than 18 years (n = 121,870) and those with missing data on either cannabis use disorder (n = 2,478) or past-year suicidal ideation (n = 4,531). The final analytic sample included 415,861 adults from 2014–2023 (see **Supplementary Table S1**).

In Table 1, 6.6% of respondents reported past-year suicidal ideation and 4.0% met criteria for cannabis use disorder (CUD). The sample was 51.6% female and 48.4% male. Nearly half were aged ≥50 years (45.7%), followed by those aged 35–49 years (24.7%) and 26–34 years (15.9%). Most respondents identified as non-Hispanic White (63.2%), with 16.4% identifying as Hispanic and 11.9% as non-Hispanic Black. Over time, suicidal ideation and CUD increased, reaching 5.2% in 2022 and 5.1% in 2023. Gender distribution remained stable, while other characteristics shifted, including increases in insurance coverage, residence in states with legalized marijuana (73.8% in 2023), and less than weekly religious attendance (**Supplementary Table S1**). Serious psychological distress rose from 10.6% in 2014 to 14.8% in 2022, past year major depressive episode from 6.7% to 8.5% in 2023, and alcohol use disorder peaked at 12.7% in 2014 before declining in the final three years (**Supplementary Table S2**). Overall, 13.6% of respondents reported nondaily cannabis use and 4.0% reported daily or near daily use.

Association between cannabis use disorder and suicidal ideation

In survey-weighted multivariable logistic regression models evaluating temporal associations in suicidal ideation and CUD status from 2014 to 2023, after adjusting for key sociodemographic and clinical factors (**Table 2, Model 1**), we found that individuals with CUD had 1.57 (95% CI: 1.44–1.72) times the odds of experiencing suicidal ideation compared with those without CUD. After including year-specific interaction terms (**Model 2**), the main CUD effect was attenuated (OR = 1.19 [95% CI, 0.93–1.53]). Among the year interactions, higher odds were observed in 2016 (OR = 1.71 [95% CI, 1.23–2.36]) and 2022 (OR = 1.50 [95% CI, 1.13–1.99]) compared to 2014, but none met the Bonferroni-adjusted threshold for significance. Overall, the CUD–suicide ideation association remained positive but statistically unchanging over time. The joint Wald tests confirmed no significant interaction between CUD and survey year (p=0.1205).

Sensitivity analyses using past-year cannabis use frequency instead of cannabis use disorder yielded results consistent with the primary models, with higher odds of suicidal ideation observed among nondaily (OR = 1.39 [95% CI, 1.31–1.47]) and daily/near-daily cannabis users (OR = 1.65 [95% CI, 1.50–1.82]) compared with non-users. However, no evidence of variability in this association was observed across the years (**Supplementary Table S3**).

Sex-specific models

Sex-specific results (**Supplementary Table S4**) showed that, in Model 1, CUD was significantly associated with greater odds of suicidal ideation among both males (OR = 1.54 [95% CI, 1.37–1.72]) and females (OR = 1.63 [95% CI, 1.45–1.83]). When year interactions were added (Model 2), estimates decreased (males: 1.09 [95% CI, 0.78–1.53]; females: 1.32 [95% CI, 0.94–1.87]), with none reaching statistical significance level. Thus, the CUD–suicide ideation relationship was consistently elevated in both sexes across years, with no significant temporal variation. Consistent

with this pattern, joint Wald tests indicated no significant temporal variability among males (p=0.0807) or females (p=0.4682).

Age-specific models

Age-specific results are presented in **Supplementary Table S5**. In Model 1, CUD was significantly associated with higher odds of suicidal ideation across all age categories: 18–25 years (OR = 1.57 [95% CI, 1.44–1.72]), 26–34 years (1.57 [95% CI, 1.36–1.80]), 35–49 years (1.58 [95% CI, 1.31–1.92]), and ≥50 years (1.72 [95% CI, 1.17–2.53]). Among adults aged 18–25 years, the association remained statistically significant in 2018 (OR = 1.31 [95% CI, 1.16–1.48]) and 2019 (OR = 1.32 [95% CI, 1.18–1.50]) in Model 1, indicating that the association between CUD and suicidal ideation was stronger in those years than in 2014 for that age group. For other estimates and age categories, the CUD–suicide ideation association did not differ significantly across years or age groups. Joint Wald tests also indicated no significant temporal variation across age groups (all p>0.05).

Race/ethnicity-specific models

Subgroup estimates for the association between CUD and suicidal ideation by race and ethnicity (**Supplementary Table S6**) showed that CUD was significantly associated with higher odds of suicidal ideation across all racial and ethnic groups in Model 1: White (OR = 1.52 [95% CI, 1.36–1.70]), Black (1.62 [1.34–1.96]), Hispanic (1.82 [95% CI, 1.51–2.18]), and other race/ethnicity (1.46 [95% CI, 1.19–1.79]). After year interaction terms were introduced (Model 2), estimates were attenuated, and no interactions reached significance ($p > 0.0022$). Overall, the positive association between CUD and suicidal ideation was consistent across racial and ethnic groups, with no statistically significant temporal variation. Joint Wald tests confirmed no significant

temporal variation for most groups; however, evidence of variation was observed among Hispanic respondents (p=0.0103).

DISCUSSION

In this repeated cross-sectional study of nationally representative data (2014-2023), we found that cannabis use disorder was associated with 57% higher odds of past-year suicidal ideation; however, contrary to our initial hypothesis, the magnitude of this association did not strengthen over time. To our knowledge, this is the first national analysis to examine decade-long patterns in the CUD–suicidal ideation relationship during a period of widespread cannabis policy liberalization and shifting social norms.

Consistent with prior U.S. research, we observed that individuals with CUD (and those with high cannabis use frequency) remain at elevated risk of suicidal thoughts (Halladay et al., 2019; Han et al., 2021; Myhre et al., 2025). As in other studies, heightened suicidality was observed among younger and female users (Han et al., 2021; Kelly et al., 2021b). Across demographic subgroups, adults with CUD showed higher prevalence of suicidal ideation, but the magnitude of these associations remained stable over the decade.

Our hypothesis of a strengthening temporal association was motivated by prior international and national evidence suggesting stronger cannabis–mental-health links as potency and use have increased. Prior Canadian data suggested stronger cannabis–suicidality associations over time, potentially driven by rising potency and declining perceived risk (Halladay et al., 2019). Cannabis potency has risen sharply in the wake of legalization (Hasin et al., 2023; Smart et al., 2017), and studies have shown concomitant associated increases in cannabis-related psychiatric emergency visits (Colby et al., 2025; Hall et al., 2018; Simmons et al., 2025), and greater detection of

cannabinoids in suicide decedents' toxicology reports, suggesting broader public-health implications of rising cannabis exposure (Matheson & Le Foll, 2020; Roberts, 2019). Individuals using high-potency cannabis also appear to have elevated suicidal behavior risk compared to people who use lower-THC formulations, suggesting a dose-response relationship between potency and suicidality (Han et al., 2021; Shamabadi et al., 2023). In the United States, several studies have also show increased cannabis use and CUD following policy liberalization (Cerdá et al., 2020; Jayawardhana et al., 2025). These findings suggested that greater exposure intensity, rising potency, and more prevalent CUD might yield stronger temporal associations with suicidality through shared psychiatric pathways. However, our analyses revealed that the strength of the CUD–suicidality relationship remained remarkably stable over time.

Several methodological and contextual factors may explain this observed stability. First, NSDUH is cross-sectional and thus unable to capture longitudinal associations between CUD and suicidality; we also examined suicidal ideation only, which may be associated with CUD in different ways than are suicide attempt or suicide death. Moreover, NSDUH's measurement of CUD changed across time as DSM-4 criteria were replaced by DSM-5, which removed "legal problems" but added "withdrawal" and "craving," introducing definitional inconsistencies (Center for Behavioral Health Statistics and Quality, 2023). In this analysis, withdrawal and craving were excluded to align post-2021 data with earlier DSM-4 definitions, while the legal-problems criterion was dropped to ensure consistency. Although necessary, these harmonization steps may have slightly underestimated CUD prevalence and attenuated its association with suicidality, contributing to the observed lack of change. However, our sensitivity analysis using cannabis-use frequency instead of CUD resulted in similarly null findings.

Second, the lack of information on cannabis product type, potency, and quantity in NSDUH likely contributes to exposure misclassification (Center for Behavioral Health Statistics and Quality, 2023). Mode of use does not uniquely identify product type; about two-thirds of vapers consume high-THC concentrates averaging more than three times the potency of flower (Stith et al., 2023). Without standardized exposure metrics such as THC/CBD ratios or milligrams consumed, survey estimates may underestimate the true intensity of use, obscuring potency-related gradients in mental-health risk and contributing to the stable associations observed in this study (Hasin & Walsh, 2020). Similarly, Asbridge et al. (2014) emphasized that screening tools and population surveys often over-rely on frequency while neglecting potency, quantity, and mode of ingestion, key factors essential for accurately capturing cannabis-related harms (Asbridge et al., 2014).

Beyond methodological concerns, the evidence for a link between cannabis potency and psychiatric outcomes remains inconsistent. Lake et al. (2025) synthesized 42 studies and found strong links between high-THC cannabis use and outcomes that included CUD or psychosis, but weak or mixed results for depression and anxiety (Lake et al., 2025). Petrilli and colleagues likewise reported no significant associations between objectively-measured THC content and anxiety or psychosis-like symptoms after adjusting for cannabis use frequency (Petrilli et al., 2023). While few studies have directly examined the relationship between high-potency cannabis and suicidality, these findings suggest that rising THC concentrations may heighten dependence and psychosis risk without proportionally increasing suicide risk.

Social normalization of cannabis use might also help explain the stable association between CUD and suicidality. As use expands and perceived harm declines, the CUD case mix increasingly includes milder, well-functioning individuals, potentially reducing average severity and weakening population-level associations with suicidality. National survey data show that while

US adults' cannabis use increased substantially from 10.4% to 15.3% between 2002 and 2017, and the prevalence of mild CUD increased from 1.4% to 1.9%, the prevalence of moderate and severe CUD *declined* – from 4.3% to 3.1% and 2.4% to 1.3%, respectively (Compton et al., 2019). Overall, these trends reflect a shift toward milder CUD presentations, which may contribute to the stable temporal association between CUD and suicidality overtime.

Although the overall temporal association remained unchanged in this study, these findings underscore the ongoing public-health need for continuous integrated screening and care coordination between mental-health and substance-use services (Halladay et al., 2019). In light of legislative action across the US to permit both recreational cannabis use and medical cannabis use, public-health surveillance should continue to monitor trends in CUD and suicidality as legalization and high-potency products proliferate (Ricci et al., 2025; Smart et al., 2017). Future studies should deploy longitudinal designs to establish temporality of associations; incorporate potency-specific exposure (THC concentration, product type, concentrate use) measurements to clarify dose-response relationships; and include the full DSM-5 CUD criteria and high-risk populations to strengthen validity.

Our findings should be interpreted in light of several limitations. NSDUH excludes institutionalized and unhoused populations, potentially underestimating risk among individuals with the greatest behavioral health burden (Center for Behavioral Health Statistics and Quality, 2023). Additionally, the past-year CUD algorithm omits DSM-5 craving and withdrawal criteria, which may lead to conservative prevalence estimates (Compton et al., 2019). Furthermore, the cross-sectional design prevents inference about causality or timing of events, and all measures are self-reported, introducing potential recall and social-desirability bias. Finally, NSDUH does not include product potency or route of use (e.g., vaping, concentrates), which limits assessment of

dose-response relationships (Center for Behavioral Health Statistics and Quality, 2023). This study's strengths include use of a large, nationally representative dataset and survey-weighted models that enhance generalizability to the U.S. population. Rigorous adjustment for depressive symptoms, alcohol-use disorder, psychological distress, and other confounders provides a conservative test of the CUD–suicidality relationship. Additionally, excluding respondents with missing CUD or suicidality data may have introduced some selection bias into our estimates.

In this study, the population-level relationship between CUD and suicidal ideation in U.S. adults has remained stable over the past decade, with persistently higher risk among women and young adults (Han et al., 2021). These findings highlight the continued importance of suicide-risk screening and mental-health support within substance-use care and reinforce the need for sustained national monitoring as legalization and high-potency products evolve.

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Tables

Table 1. Weighted Characteristics of U.S. Adult Respondents (NSDUH, 2014–2023)	
Characteristics	n* (Weighted %)
Cannabis use disorder (CUD)	25,406 (4.0%)
Sex	
Male	190,014 (48.4)
Female	225, 847 (51.6)
Age group (years)	
18–25	130,381 (13.7)
26–34	84, 986 (15.9)
35–49	110, 939 (24.7)
50+	89,555 (45.7)
Race/ethnicity	
NH White	253,390 (63.2)
NH Black	49,197 (11.9)
Hispanic	70,366 (16.4)
Native American/ Alaskan Native	5,694 (0.5)
Other Pacific Islander	1,985 (0.4)
Asian American	20,769 (5.7)
Multiple race	14,460 (1.7)
Education	
<High school	48,761 (11.8)
High school	108,396 (26.2)
Some college	131,643 (30.2)
College graduate	127,061 (31.8)
Family income	
<$20K	78,873 (16.2)
$20K–$49K	122,720 (28.7)
$50K–$74K	64,343 (15.8)
≥$75K	149,925 (39.4)
Insurance status	
Private only	223,404 (49.9)
Public only	81,552 (18.8)

Uninsured	46,238 (9.9)
Multiple	47,221 (19.3)
Other	11,536 (2.1)
Health status	
Excellent	90,679 (19.7)
Very good	156,861 (35.7)
Good	120,418 (30.2)
Fair/poor	47,818 (14.4)
Multimorbidity	
None	278,519 (58.0)
One condition	96,336 (26.9)
Two conditions	26,907 (9.4)
≥3 conditions	14,099 (5.7)
Religious attendance	
< 25 times	286,100 (65.7)
≥25 times	127,565 (34.3)
Alcohol use disorder	56,789 (11.4)
Past-year serious psychological distress	70,091 (12.3)
Past-year major depressive episode	40,778 (7.6)
State has legalized medical marijuana	266,682 (37.5)
Suicidal ideation	26, 670 (6.6)

*n is unweighted sample. Percentages are weighted. Missing values present for: insurance (n=5,910), general health (n=85), religious attendance (n=2,196), and past-year major depressive episode (n=2,853).

Table 2: Adjusted odds ratios from pooled multivariable logistic regressions of cannabis use disorder (CUD), survey year, and their interaction on suicidal ideation, 2014–2023.

Suicidal ideation	Model 1[a] OR (95% CI)	Model 2[b] OR (95% CI)
CUD	**1.57 (1.44, 1.72)**	1.19 (0.93, 1.53)
Year		
2014	Ref.	Ref.
2015	1.01 (0.92, 1.11)	0.99 (0.88, 1.10)
2016	1.02 (0.92, 1.13)	0.97 (0.87, 1.09)
2017	1.07 (0.95, 1.19)	1.05 (0.93, 1.19)
2018	1.05 (0.94, 1.18)	0.98 (0.89, 1.08)
2019	1.07 (0.94, 1.23)	1.08 (0.92, 1.28)
2020	0.99 (0.88, 1.12)	0.97 (0.85, 1.11)
2021	1.00 (0.87, 1.15)	0.97 (0.82, 1.15)
2022	1.03 (0.93, 1.15)	0.99 (0.83, 1.15)
2023	1.01 (0.91, 1.13)	0.99 (0.88, 1.12)
Interaction terms		
CUD×2015	–	1.28 (0.93, 1.75)
CUD×2016	–	1.71 (1.23, 2.36)
CUD×2017	–	1.17 (0.88, 1.55)
CUD×2018	–	1.38 (1.00, 1.88)
CUD×2019	–	1.37 (0.92, 2.04)
CUD×2020	–	1.29 (0.87, 1.92)
CUD×2021	–	1.39 (0.99, 1.96)
CUD×2022	–	1.50 (1.13, 1.99)
CUD×2023	–	1.24 (0.87, 1.77)

Model 1 includes main effects only. Model 2 includes interaction terms for CUD*year.
The Wald F-test evaluating the overall effect of the interaction terms in Model 2 was not statistically significant (p=0.1205).
*Bold font indicates significant test at Bonferroni-adjusted α <0.00227.
[a] Model 1 additional covariates include sex, age group, race/ethnicity, education, household income, health insurance status, self-rated health, multimorbidity, religious attendance, alcohol use disorder (AUD), psychological distress, major depressive episode (MDE), and state marijuana legalization status.
[b] Model 2 additional covariates include sex, age group, race/ethnicity, education, household income, health insurance status, self-rated health, multimorbidity, religious attendance, alcohol use disorder (AUD), psychological distress, major depressive episode (MDE), and state marijuana legalization status.
Abbreviations: OR, odds ratio; CI, confidence intervals; CUD, cannabis use disorder.