Association between Past-Year Marijuana Use and Past-Year Suicidal Ideation among Young Adults aged 18-25

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Background

We derived the following insights performing initial exploration:

- Between 2021 and 2023, 14.2% of U.S. young adults (age 18-25) had a co-occurring substance use and mental health disorder, which is more than other subgroups.
- Between 2021 and 2023, about a quarter of U.S. young adults reporting using marijuana in the past year, and the weighted average past-year marijuana use for young adults was 53.74 days, which was more days than past-year alcohol use.
- Between 2021 and 2023, greater than 10% of U.S. young adults experienced suicidal ideation.

Previous cross-sectional studies found marijuana and orbitofrontal cortex (OFC) gray matter volume to be associated with each other: higher marijuana use related to reduced OFC gray matter volume, and vice versa. Brain OFC gray matters plays an important role in emotional regulation, decision-making, reward processing, and behavioral control.

Research Question

To what extent is past-year marijuana use associated with past-year suicidal ideation among young adults aged 18-25?

Data & Methods

Data Source:

- **2021-2023 National Survey on Drug Use and Health (NSDUH)** – Leading source of population-based statistical data on drug use, mental health, and receipt of behavioral treatment

Methods:

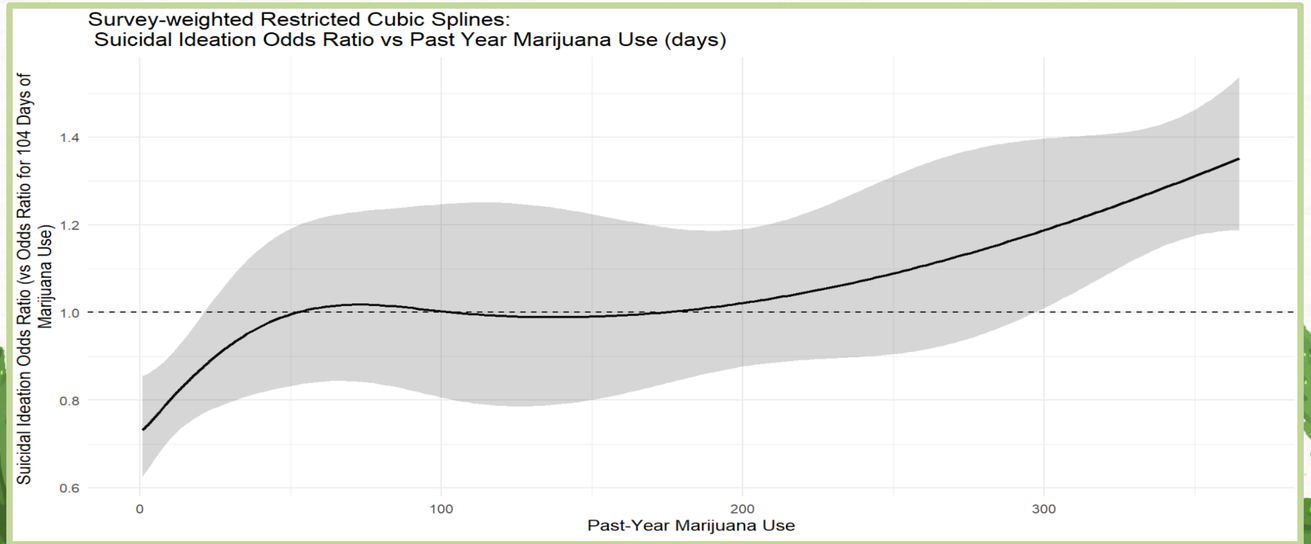
- **Exploratory Data Analysis** – Survey-weighted bar plots with error bars, Chi-square tests, Mann-Whitney U tests
- **Logistic Regression –** Examine the strength of the linear association between past-year marijuana use and past-year suicidal ideation
- **Restricted Cubic Splines (RCS) –** Examine the non-linear association between past-year marijuana use and past-year suicidal ideation

Main Results

Logistic Regression

	Unadjusted OR (95% CI) [a]	Adjusted OR (95% CI) [b]
Past Year Marijuana Use		
0-90 days (ref)	1.00	1.00
90-180 days	2.04 (1.62, 2.57)*	1.68 (1.16, 2.44)*
190-270 days	2.13 (1.76, 2.58)*	1.55 (1.13, 2.13)*
270-360 days	2.72 (2.39, 3.09)*	1.48 (1.16, 1.90)*

* p-value < 0.05 indicating a significant association
[a] Unadjusted ORs: 95% CIs were estimated by a survey-weighted logistic regression model that contained only the main studied factor (yearly marijuana use).
[b] Adjusted ORs: 95% CIs were estimated by a survey-weighted logistic regression model that contained all significant covariates, which included sex, race/ethnicity, education level, work status, private health insurance, household size, alcohol use, binge alcohol use, cigarette use, nicotine vaping, receipt of in-patient substance use treatment, and mental health covariates (felt nervous, difficulty concentrating).



Discussion

-Findings

We found the following:

1. **A strong, positive association** between past-year marijuana use and past-year suicidal ideation among young adults aged 18-25, even after adjusting for sociodemographic, substance use, and mental health covariates
2. A **non-linear association** between past-year marijuana use and past-year suicidal ideation with a plateau in odds of suicidal ideation at 50-200 days of use

-Public Health Implications

These results inform public health policy makers, clinicians, epidemiologists, and colleges around the U.S. on the importance of marijuana use prevention and minimization.

-Limitations

- **Lack of causality** due to no temporality
- **Bias** including recall bias, self-report bias, misclassification bias, and overadjustment bias
- **Residual confounding** including discrimination and impulsivity

Next Steps

- **Cohort and RCT (randomized controlled trial)** studies on the marijuana use-suicidal ideation association to add in temporality
- **Adjusted RCS model** to account for variables that weren't included in our original RCS model

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Works Cited

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- Cheetham et al. 2012. "Orbitofrontal Volumes in Early Adolescence Predict Initiation of Cannabis Use." *Biological Psychiatry* 71(8): 684–692.