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 studies found marijuana use to be bidirectionally associated with brain orbitofrontal cortex (OFC) gray matter volume, which is important for emotional regulation, decision-making, 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 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
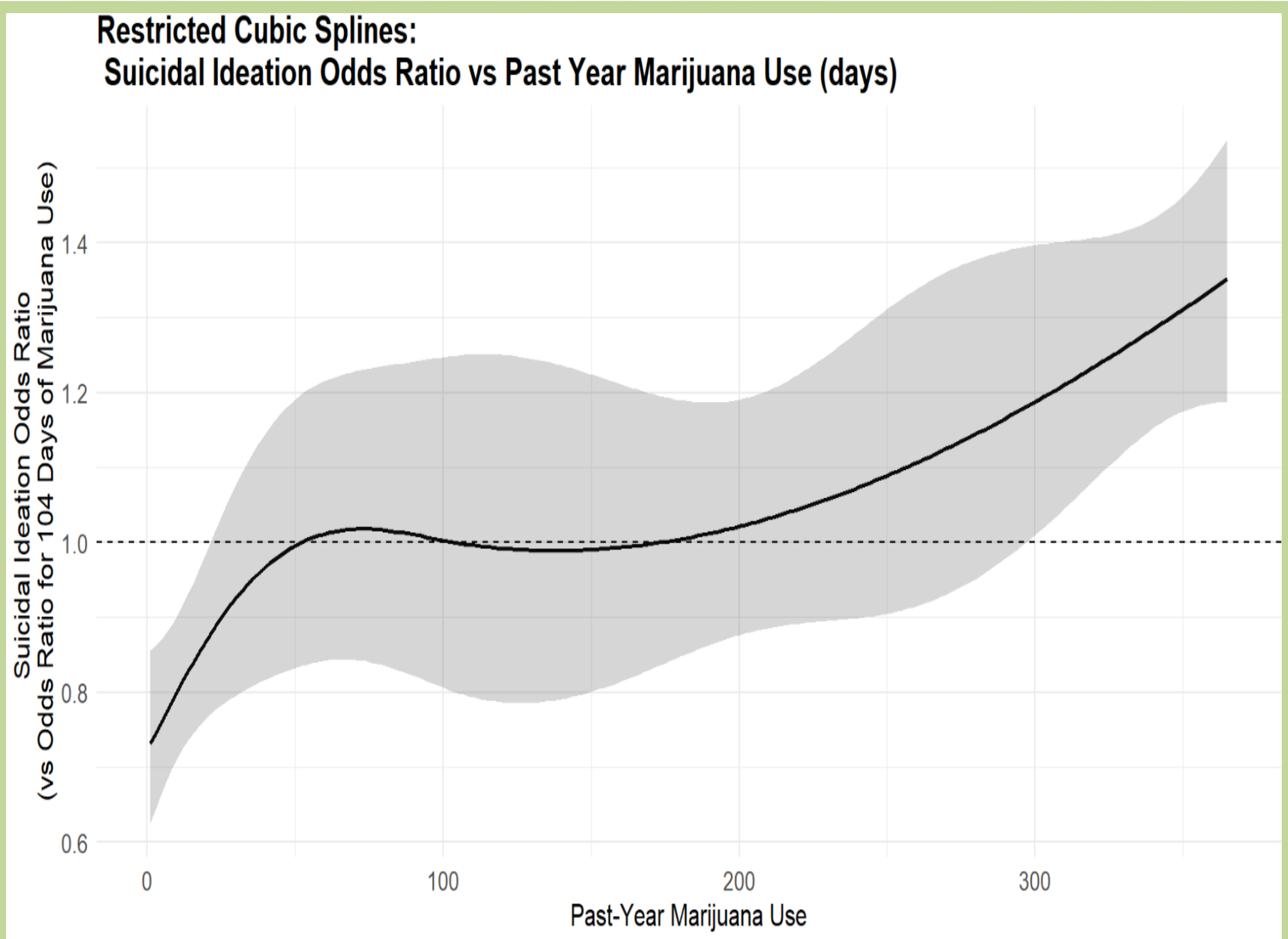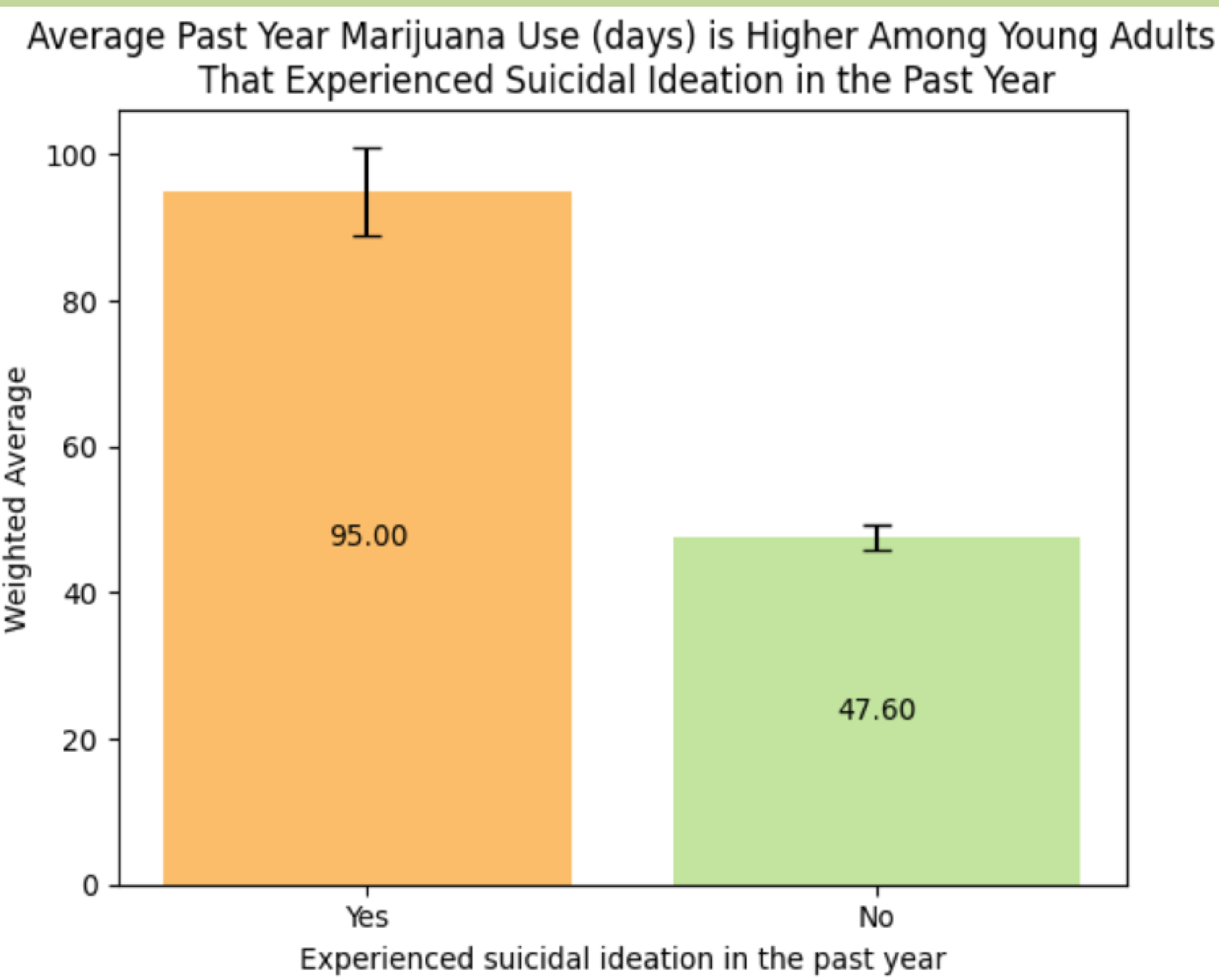
Main Results

Young Adults Aged 18-25 Frequently Experience Any Mental Illness and Substance Use Disorder

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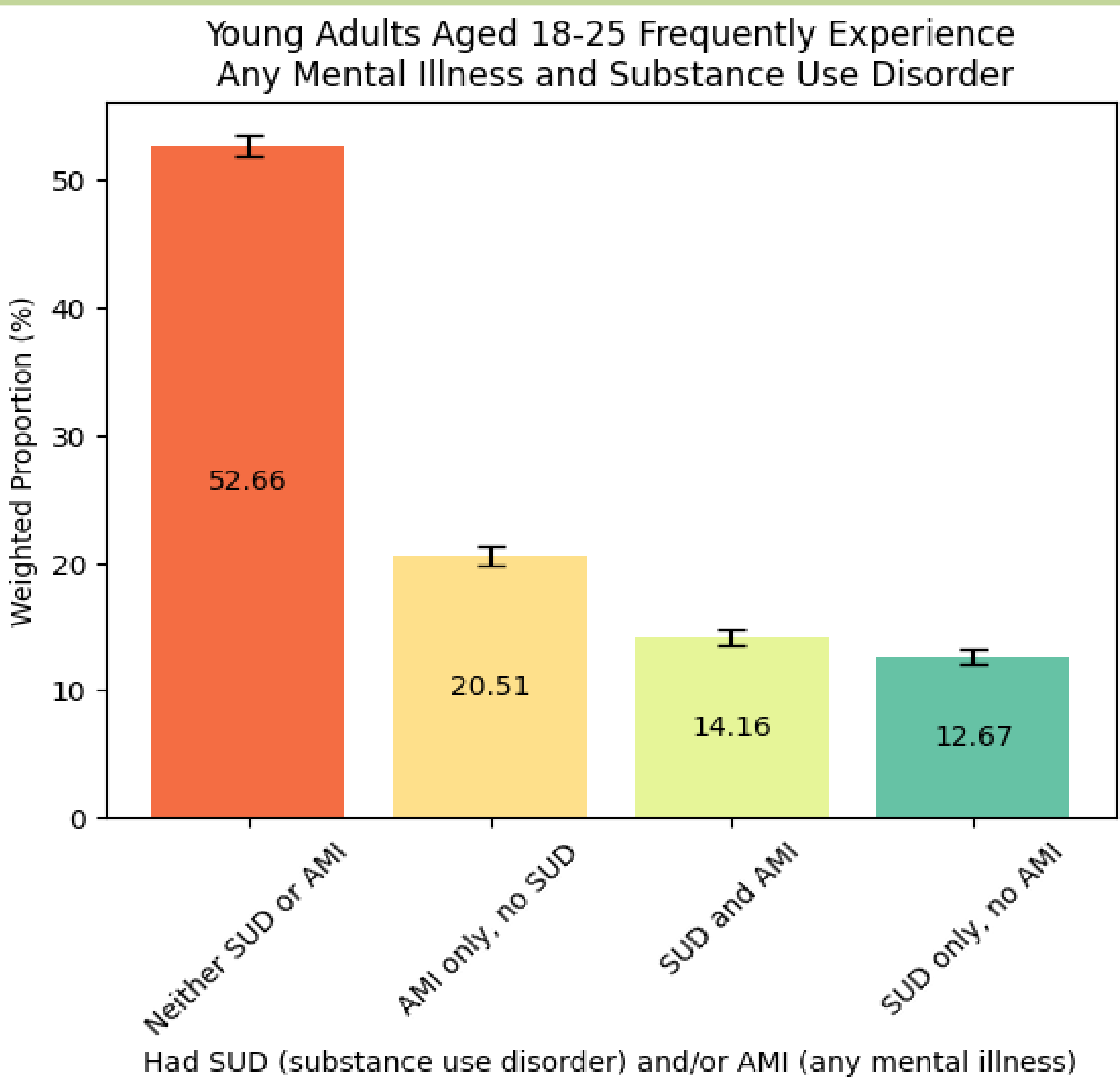
Past Year Marijuana Use	Unadjusted Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)
0-90 days (ref)	1.00	1.00
90-180 days	2.04 (1.62, 2.57)*	1.68 (1.16, 2.44)*
190-270 days	2.13 (1.76, 2.58)*	1.55 (1.13, 2.13)*
270-360 days	2.72 (2.39, 3.09)*	1.48 (1.16, 1.90)*

* *p*-value < .05 indicating a significant association
Unadjusted and adjusted odds ratios measure the association without and with significant covariates respectively

Average Past Year Marijuana Use (days) is Higher Among Young Adults That Experienced Suicidal Ideation in the Past Year

Restricted Cubic Splines: Suicidal Ideation Odds Ratio vs Past Year Marijuana Use (days)

Discussion

-Findings
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

- Filbey et al. 2014. "Long-term Effects of Marijuana Use on the Brain." *PNAS* 111(47): 16913–16918.
- Cheetham et al. 2012. "Orbitofrontal Volumes in Early Adolescence Predict Initiation of Cannabis Use." *Biological Psychiatry* 71(8): 684–692.