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Demographic Risk Factors for Co-occurring Suicidality and Cannabis Use Disorders: Findings from a Nationally Representative United States Sample

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Abstract

Objective.—Burgeoning research suggests a link between suicidality (i.e., ideation, attempts) and cannabis use; however, little is known about which demographic groups are at increased risk of co-occurring suicidality and cannabis use disorders (CUD). This study tested differences in suicidality, CUD, and their co-occurrence by gender, age, race/ethnicity, and sexual orientation in a nationally representative U.S. sample.

Method.—Five years (2015–2019) of National Survey of Drug Use and Heath surveys were combined. Multinomial logistic regressions tested demographic differences in odds of suicidality only, CUD only, and co-occurring CUD and suicidality, relative to neither suicidality nor CUD. Covariates included survey year, major depressive episode, and other substance use disorders.

Results.—Men had higher odds of co-occurring suicidal ideation and CUD than women (AOR=2.06). All older age groups reported lower odds of co-occurring suicidal ideation and CUD and co-occurring suicide attempts and CUD than emerging adults (AORs=.06-.39). Black/African American (AOR=1.42) and Native (AOR=2.16) adults reported higher odds of co-occurring suicidal ideation and CUD than White adults. Black/African American (AOR=4.05) and Hispanic/Latinx (AOR=2.49) adults reported higher odds of co-occurring CUD and suicide attempts than

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Author Agreement

All four authors confirm that the work described has not been published previously, it is not under consideration for publication elsewhere, its publication is approved by all authors and the responsible authorities where the work was carried out, this secondary data analysis of de-identified and publicly available data was conducted in accordance with APA ethical standards, and, if accepted, it will not be published elsewhere including electronically in the same form, in English or in any other language, without the written consent of the copyright-holder.

Author CRediT Roles. Lourah Kelly led the conceptualization of the study, data download and variable computation, data analysis, data visualization, and original drafts of the manuscript. Tess Dradzdowski assisted with background research, interpretation of results, discussion writing, and editing. Nicholas Livingston assisted with background research, discussion writing, and editing. Kristyn Zajac led data analytic planning including choice of demographic groups of focus, study rationale, and assisted with manuscript writing and editing.

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White adults. Gay/lesbian (AOR=2.04) and bisexual (AOR=3.16) adults reported higher odds of co-occurring suicidal ideation and CUD than heterosexual adults.

Conclusions.—Men, emerging adults, Black/African American, Native, and sexual minority groups had elevated risk of co-occurring suicidal ideation and CUD. Emerging adults, Black/African American, and Hispanic/Latinx groups had elevated risk of co-occurring suicide attempts and CUD.

Keywords

cannabis use disorder; suicidal ideation; suicide attempt; nationally representative

Burgeoning research indicates a link between suicidality (namely, suicidal ideation and attempts) and cannabis use. More frequent cannabis use is associated with greater likelihood of recent suicidal ideation (SI) among adults (Ilgen et al., 2009). Adolescent cannabis use may be a risk factor for suicidality in emerging adulthood (Pedersen, 2008). However, very little research has focused on identifying demographic groups at higher risk for co-occurring SI and cannabis use, whereas such risk factors for alcohol- and opioid-related suicidality are fairly well-documented (e.g., Braden et al., 2017; Caetano et al., 2013; Chan et al., 2019; Keyes et al., 2012). This lack of research attention may be due to the perception that, although cannabis use occurs at higher rates among persons with SI, it is unlikely to be a direct risk factor for suicidality. This assumption is not universally supported; recent research shows that CUD is an independent risk factor for suicide attempts, even when controlling for other substance use disorders (Adkisson et al., 2019; Kimbrel et al., 2017). Thus, identification of demographic groups with the highest rates of co-occurring suicidality and CUD fills an important gap in this growing literature.

Research suggests that men, emerging adults, Native American, and sexual minority adults are at greatest risk for suicidality. The “gender paradox” of suicide (Canetto & Sakinofsky, 1998; Schrijvers et al., 2012) is the phenomenon that men show higher rates of suicide death, while women report higher rates of SI and attempts (Borges et al., 2010; Mościcki, 1994; Nock et al., 2008). Additionally, emerging adults (18–25 years) show higher rates of past year SI and attempts compared to adults 26 and older (SAMHSA, 2020a). Multiracial and Native American adults report the highest rates of past year SI, followed by non-Hispanic White, Black/African American, Hispanic/Latinx, and Asian adults (SAMHSA, 2020b). Sexual minority adults report double the rates of lifetime suicide attempts compared to heterosexual adults (Hottes et al., 2016).

Similar patterns are apparent in cannabis use by gender and age, but somewhat different for race/ethnicity and sexual identity. Men report roughly twice the odds of lifetime and past year CUD than women (Hasin et al., 2016; Stinson et al., 2006), and 18–29 year-olds report 7.2 times the odds of past year CUD than adults 45 and older (Hasin et al., 2016). Among those who use cannabis in the U.S., CUD is more common among Black/African Americans, Hispanic/Latinx, and Native Americans than non-Hispanic Whites (Wu et al., 2016). Sexual minority women show higher rates of CUD than heterosexual women, a pattern not found in sexual minority men (Krueger et al., 2020; McCabe et al., 2009).

This study addresses gaps in knowledge about which demographic groups disproportionally experience co-occurring suicidality and CUD. We hypothesized that men, emerging adults, racial minority, and sexual minority groups will be over-represented among persons with co-occurring suicidality and CUD.

Materials and Methods

Procedures

Data were from five years (2015–2019) of the National Survey of Drug Use and Health (NSDUH), a nationally representative, cross-sectional survey of the U.S. civilian population living in community settings. The current analysis used data from adults ages 18 and older (unweighted N=214,505, of which N=208,495 had complete data). Missing data rates were: 0.7% (n=1,551) for SI, 1.2% (n=2,564) for major depressive episode, 1.9% (n=4,113) for sexual identity, and 0.7% (n=1,569) for substance use disorder other than CUD. Missing data on other variables were imputed based on predictive mean neighborhood approaches (see Center for Behavioral Health Statistics and Quality, 2020a). Face-to-face computer-assisted interviews were conducted by trained assessors. For more information about NSDUH methods, see Center for Behavioral Health Statistics and Quality, 2020b. The 2015–2019 sampling and survey methods were identical, so data across years were collapsed to increase statistical power. The NDSUH is sponsored by SAMHSA, with oversight by the Research Triangle Institute International Institutional Review Board (IRB). The current analysis of de-identified data is considered exempt human subjects research by the lead author's institutional IRB.

Measures

Gender was coded as male or female.

Age was categorized into five groups: 18–25, 26–34, 35–49, and 50+.

Race/ethnicity was categorized as Black/African American, Native (including both Native American/Alaskan Native and Native Hawaiian/Pacific Islander), Asian, Hispanic/Latinx (of any race), Multiracial, and White.

Sexual orientation was coded as gay/lesbian, bisexual, or heterosexual.

Suicidality included two items assessing past year SI (i.e., "At any time in the past 12 months, did you seriously think about trying to kill yourself?") and suicide attempts. The attempt item ("During the past 12 months, did you try to kill yourself?") was only administered to persons who endorsed SI (unweighted n=12,879).

Cannabis use disorders (CUD) were defined as meeting criteria for DSM-IV cannabis abuse or dependence (American Psychiatric Association, 2000). Persons reporting using cannabis, hashish, or blunts in the past year answered questions related to CUD symptoms.

Covariates included survey year, plus the two diagnoses assessed by the NSDUH that are empirically related to CUD and/or suicidality: *major depressive episode* and *substance use disorders other than CUD* (Blanco et al., 2016; Hasin et al., 2016; Lynskey et al.,

2004; Wu et al., 2016). Past year *major depressive episode* included at least two weeks of depressed/anhedonic mood, plus at least five associated symptoms. Past year *substance use disorders* outside of cannabis (i.e., alcohol, cocaine, heroin, hallucinogens, inhalants, methamphetamine, misused prescription drugs) were assessed using DSM-IV criteria. *Year* of survey administration (2015–2019) controlled for possible population-level changes in suicidality or CUD over time.

Data Analytic Plan.—Multinomial logistic regressions using SPSS Complex Samples Version 26 (IBM Corp., 2017) tested demographic correlates of suicidality only, CUD only, and co-occurring suicidality and CUD, when accounting for covariates listed above and separately for SI and attempts. Absence of suicidality and CUD was the dependent reference group. Given the large sample size and quantity of comparisons, α=.01.

Results

In the full sample, past year prevalence of SI alone was 4.3%, suicide attempt alone was 0.9%, and CUD alone was 1.5%. Rates of co-occurring SI and CUD were 0.3% and co-occurring suicide attempt and CUD were 0.1%.

SI+CUD Analyses.

Table 1 shows multinomial logistic regression results examining demographic differences in SI and CUD co-occurrence.

Gender.—Men had higher odds of SI, CUD, and their co-occurrence compared to women.

Age.—Adults aged 26–35, 36–49, and 50+ all had lower odds of SI, CUD, and their co-occurrence compared to emerging adults (18–25).

Race/ethnicity.—Black/African Americans reported lower odds of SI, but higher odds of CUD and co-occurring SI and CUD compared to Whites. Native American and Hawaiian/Pacific Islanders had higher odds of SI, CUD, and their co-occurrence relative to Whites. Asians had lower odds of SI alone and CUD alone compared to Whites. Multiracial adults had lower odds of SI alone than Whites. Hispanic/Latinx adults did not differ in SI, CUD, or their co-occurrence compared to Whites.

Sexual orientation.—Gay/lesbian and bisexual adults had higher odds of SI, CUD, and their co-occurrence than heterosexual adults.

Suicide Attempt+CUD Analyses.

Table 2 shows multinomial logistic regression results examining demographic differences in suicide attempt and CUD co-occurrence.

Gender.—Men had higher odds of CUD than women. Men and women did not differ in odds of suicide attempts or their co-occurrence.

Age.—Adults aged 26–35, 36–49, and 50+ had lower odds of suicide attempts, CUD, and their co-occurrence than emerging adults (18–25).

Race/ethnicity.—Compared to Whites, Black/African American and Hispanic/Latinx adults had higher odds of co-occurring suicide attempts and CUD. Asian, Native, and Multiracial adults did not differ from Whites in suicide attempts, CUD, or their co-occurrence.

Sexual orientation.—Bisexual adults had higher odds of suicide attempts, but did not differ from heterosexuals in odds of CUD or their co-occurrence. Gay/lesbian adults did not differ from heterosexuals in odds of suicide attempts, CUD, or their co-occurrence.

Discussion

This study investigated demographic risk factors for co-occurring CUD and suicidality in a nationally representative U.S. sample. Men, emerging adults, Black/African American, Native, and sexual minority adults had the highest rates of co-occurring SI and CUD. Emerging adults, Black/African American, Hispanic/Latinx and sexual minority adults had the highest odds of co-occurring suicide attempts and CUD. Men are less likely to seek depression treatment (Seidler et al., 2016) and more likely to have co-occurring depression and substance use disorders than women (Davis et al., 2008). One explanation for gender differences in this study is that men may be more likely to use cannabis to cope with depressed mood and SI, following negative reinforcement substance use models (Baker et al., 2004). Contrary to our hypothesis, men and women reported similar likelihood of co-occurring CUD and suicide attempts. This finding mirrors relatively recent research that found nonsignificant or small gender differences in suicide attempts in national U.S. samples (Crosby et al., 2011; Lipari et al., 2015). The current study used more recent nationally representative data and found no gender differences in suicide attempts regardless of CUD status, suggesting a potential shift in the gender paradox in suicidality. Male dominance in CUD (Hasin et al., 2016) may also eclipse gender differences in co-occurring CUD and suicide attempts.

Given past studies showing high rates of SI, suicide attempts, and CUD among emerging adults (Hasin et al., 2016; SAMHSA, 2019a), our finding that *co-occurring* CUD and suicidality were highest among emerging adults is not surprising. Emerging adulthood is characterized by self-exploration and instability (Arnett, 2000), risk taking including substance misuse (Arnett, 2005), and emergence of mental health disorders (Kessler et al., 2005), which may confer risk for and co-occur with suicidality. National studies on suicidality, CUD, and age tend to compare emerging adults to adults over 26 (SAMHSA, 2019a); by comparing smaller categories of age groups, our study suggests eldest adults are not driving age differences in suicidality and CUD.

Findings showing higher rates of co-occurring CUD and suicidality among racial/ethnic and sexual minority groups may be due to minority stress experiences. The minority stress model posits that sexual minority persons experience elevated risk for psychological distress and poor health outcomes (e.g., substance use, suicidality) due to stress associated with

marginalization (Meyer, 2003); this model has been extended to marginalized racial groups (Wong et al., 2014). Stigma, prejudice, and discrimination are related to increased suicidality and substance use in sexual and racial/ethnic minority populations (Lea et al., 2014; McCabe et al., 2010; Polanco-Roman et al., 2019; Sanders-Phillips et al., 2014). The present study extends these findings by demonstrating links between increased rates of *co-occurring* suicidality and CUD among racial/ethnic and sexual minority groups.

Results should be interpreted in light of study limitations. Only two forms of suicidality were examined; other brief scales (e.g., Columbia Suicide Severity Rating Scale; Posner et al., 2011) could assess a broader range of suicidality (e.g., thoughts of death, preparatory behaviors) without significantly increasing burden. Use of self-reports may have resulted in underreporting or even missing data on sensitive topics, including CUD, suicidality, and sexuality due to stigma around these topics. Non-premeditated (i.e., impulsive) suicide attempt prevalence may be underestimated because adults without SI were not administered attempt items. Cannabis items may have excluded edibles or concentrates. The CUD assessment did not measure withdrawal, despite evidence that cannabis withdrawal is similar to other substances (Budney et al., 2004). The NSDUH provides data on the mental health diagnoses included as covariates in these analyses (i.e., depression, other substance use disorders) but lacks specific data on other diagnoses linked to both CUD and suicidality (e.g., anxiety disorders, bipolar, psychotic disorders); such diagnoses should be included in future studies. Since the NSDUH is an annual cross-sectional survey; directions between CUD and suicidality relationships could not be determined.

Future longitudinal research should investigate relationships between CUD and suicidality throughout adulthood and factors that explain *why* specific demographic groups report greater rates of CUD and suicidality. Findings from this study shed light on demographic risk for co-occurring CUD and SI. This comorbidity is concerning because cannabis use may confer risk for suicide independent of other substance use (Adkisson et al., 2019; Kimbrel et al., 2017). Current findings indicate a need to increase suicide risk screening among men, emerging adults, Black/African American, Hispanic/Latinx, Native, and sexual minority adults presenting with CUD. CUD screening among adults in these groups who present with suicide risk is also indicated, particularly given low rates of formal treatment seeking for CUD (Kerridge et al., 2017). Culturally responsive interventions are needed to decrease negative outcomes associated with co-occurring suicidality and CUD within at-risk groups.

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Data availability statement.

The data that support the findings of this study are available in the public domain through the Substance Abuse and Mental Health Data Archive website at https://www.datafiles.samhsa.gov/study-series/national-survey-drug-use-and-health-nsduhnid13517.

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Highlights

- Demographic groups show disparities in suicidality and cannabis use disorder (CUD)
- Men (vs women) had higher odds of co-occurring suicidal ideation (SI)+CUD
- Emerging adults (vs older adults) had higher odds of SI+CUD and suicide attempts+CUD
- Black and Latinx (vs non-Hispanic White) adults had higher odds of suicide attempts+CUD
- Sexual minority (vs heterosexual) adults had higher odds of SI+CUD

Table 1.

Multinomial Logistic Regression Model Identifying Adults with Suicidal Ideation, Cannabis Use Disorder, and their Comorbidity Across Demographic Groups (Unweighted N = 208,495)

No Suicidal Ideation or Cannabis Use Disorder = Reference	**Suicidal Ideation**	**Cannabis Use Disorder**	**Suicidal Ideation + Cannabis Use Disorder**
	4.0% (unweighted *n* = 11,727)	1.2% (unweighted *n* = 3,986)	0.3% (unweighted *n* = 1,162)
Demographic Variable	AOR [95% CI]	AOR [95% CI]	AOR [95% CI]
Gender (Male)	1.13 ** [1.04–1.21]	2.48 *** [2.25–2.73]	2.06 *** [1.74–2.43]
Age (18–25)			
26–35 years	.62 *** [.57–.67]	.40 *** [.36–.44]	.29 *** [.24–.36]
36–49 years	.46 *** [.42–.49]	.20 *** [.17–.22]	.12 *** [.09–.17]
50+ years	.37 *** [34–40]	.08 *** [.06–.10]	.06 *** [.04–.08]
Race/ethnicity (Non-Hispanic White)			
Black/African American	.89 ** [.81–.96]	1.83 *** [1.66–2.03]	1.42 ** [1.11–1.82]
Hispanic/Latinx	1.0 [.77–1.30]	1.25 [.91–1.73]	1.37 [.95–1.97]
Asian	.73 *** [.64–.84]	.60 ** [.41–.87]	.76 [.50–1.14]
Native	1.24* [1.01–1.52]	1.66 *** [1.29–2.13]	2.16 *** [1.43–3.27]
Multiracial	.84 *** [.77–.92]	.96 [.82–1.12]	.80 [.60–1.08]
Sexual identity (Heterosexual)			
Gay/Lesbian	2.01 *** [1.76–2.30]	1.56 ** [1.22–2.01]	2.04 ** [1.37–3.03]
Bisexual	2.40 *** [2.18–2.64]	1.87 *** [1.60–2.19]	3.16 *** [2.56–3.89]

Note.

** $p < .01$

*** $p < .001$.

CI = Confidence Interval. AOR = Adjusted odds ratios. Analyses adjusted for past year substance use disorder other than cannabis and major depressive disorder. Reference groups are within parentheses (e.g., heterosexual).

Table 2.

Multinomial Logistic Regression Model Identifying Adults with Suicide Attempts, Cannabis Use Disorder, and their Comorbidity Across Demographic Groups (Unweighted N = 12,879)

No Suicide Attempt or Cannabis Use Disorder = Reference	**Suicide Attempt**	**Cannabis Use Disorder**	**Suicide Attempt + Cannabis Use Disorder**
	11.6% (unweighted *n* = 907)	5.7% (unweighted *n* = 1,692)	1.3% (unweighted *n* = 255)
Demographic Variable	AOR [CI]	AOR [CI]	AOR [CI]
Gender (Male)	.84 [.70–1.00]	2.01*** [1.66–2.43]	1.07 [.75–1.53]
Age (18–25)			
26–35 years	.60*** [.47–.77]	.43*** [.35–.54]	.39*** [.25–.62]
36–49 years	.66*** [.53–.81]	.24*** [.16–.34]	.18*** [.10–.33]
50+ years	.60*** [.47–.77]	.13*** [.08–.20]	.13** [.04–.45]
Race/ethnicity (Non-Hispanic White)			
Black/African American	1.70 [1.35–2.15]	1.26 [.91–1.75]	4.05*** [2.62–6.24]
Hispanic/Latinx	1.65 [.77–3.55]	1.28 [.87–1.88]	2.49** [1.34–4.65]
Asian	1.52 [.94–2.46]	.96 [.66–1.40]	1.13 [.45–2.88]
Native	1.18 [.85–1.64]	1.53 [.95–2.46]	2.22 [.97–5.08]
Multiracial	1.39 [1.09–1.77]	.89 [.62–1.27]	1.34 [.88–2.05]
Sexual orientation (Heterosexual)			
Gay/Lesbian	1.42 [.98–2.05]	.82 [.52–1.28]	2.16 [.96–4.89]
Bisexual	1.37** [1.14–1.65]	1.27 [1.01–1.59]	1.58 [.91–2.75]

Note. Percentages are of the sub-sample who reported on suicide attempts.

** $p < .01$

*** $p < .001$.

CI = Confidence Interval. AOR = Adjusted odds ratios. Analyses adjusted for past year substance use disorder other than cannabis and major depressive disorder. Reference groups are within parentheses (e.g., heterosexual).