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## EXPLORING THE ASSOCIATION BETWEEN PSYCHOLOGICAL DISTRESS AND CANNABIS EDIBLE USE AMONG U.S. ADULTS: A DESCRIPTIVE EPIDEMIOLOGIC STUDY

Zeeshan Ul Haq <sup>1</sup>, Md Rakibul Hasan <sup>2</sup>

<sup>1</sup>Department of Pathology and Laboratory Medicine, University of Louisville, United States

<sup>2</sup>Department of Medicine, Cambridge University Hospitals NHS Foundation Trust, Cambridge, England, UK.

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### Abstract

**Background:** Cannabis edibles represent a rapidly expanding segment of cannabis consumption in the United States, yet their association with psychological distress remains poorly understood. This descriptive cross-sectional study aimed to assess whether adults experiencing past-month psychological distress were more likely to report cannabis edible use compared with those without distress, providing evidence to inform mental health-focused prevention strategies.

**Methods:** Data were drawn from the 2023 National Survey on Drug Use and Health (NSDUH) and included adults aged 18 years and older. Past-month cannabis edible use served as the dependent variable, and past-month psychological distress was the primary predictor. Weighted prevalence estimates and multivariable survey-weighted logistic regression analyses were conducted, adjusting for demographic and behavioral covariates.

**Results:** The prevalence of edible use was substantially higher among adults with psychological distress (13.5%, 95% CI: 12.0–15.0) compared with those without distress (5.6%, 95% CI: 5.2–5.9). In adjusted analyses, psychological distress remained significantly associated with increased odds of edible use (AOR = 1.44, 95% CI: 1.21–1.71,  $p < 0.001$ ). Edible users were also more likely to engage in concurrent alcohol and tobacco use and report symptoms of depression, anxiety, or suicidal ideation, suggesting overlapping behavioral risk patterns.

**Conclusion:** Psychological distress was independently linked to greater cannabis edible use among U.S. adults. Future research should explore causal pathways and examine how product potency, accessibility, and stress-related coping behaviors contribute to this relationship to guide public health interventions and harm-reduction efforts.

**Keywords:** Psychological distress, cannabis edibles, substance use, mental health.

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### \*Corresponding Author

Zeeshan Ul Haq

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### INTRODUCTION

Cannabis legalization across the United States has contributed to the growing availability and acceptance of alternative cannabis products, including edibles such as gummies, chocolates, and beverages. These products are often perceived as discreet and safer alternatives to smoking or vaping, attracting both novice and regular consumers [1, 2]. However, the pharmacological characteristics of edibles differ markedly: oral ingestion leads to delayed onset and prolonged psychoactive effects, increasing the likelihood of accidental overconsumption, anxiety, and impaired judgment [3,4].

Psychological distress-comprising symptoms of anxiety, depression, and emotional suffering-has been

consistently associated with higher cannabis use and misuse. Individuals experiencing distress often report using cannabis for self-medication or symptom management [5]. Yet, frequent or high-potency cannabis consumption may aggravate anxiety and depressive symptoms, suggesting a bidirectional relationship between cannabis use and mental health [6]. Opioid and other drug use profoundly intensifies mental health challenges and often overlaps with cannabis behaviors, including marijuana edible consumption. National data show that approximately 48% of individuals with opioid use disorder experience co-occurring depression or anxiety, and nearly 32% report serious psychological distress or suicidal ideation [7]. Among people engaging in polysubstance use involving opioids, alcohol, and cannabis, the prevalence of depressive symptoms rises to over 55%, and anxiety disorders exceed 40%, compared to less than 15% among non-users [8,9]. Marijuana edibles, often perceived as safer alternatives, are increasingly used for emotional regulation or relief from

withdrawal symptoms, yet their delayed onset and prolonged psychoactive duration frequently lead to overconsumption, panic, or mood destabilization.

Evidence suggests that individuals with prior opioid or stimulant use are two to three times more likely to consume high-potency cannabis or edibles, heightening risks of paranoia, cognitive decline, and depressive relapse [10,11]. This convergence of substance use and psychological distress illustrates a reinforcing cycle in which self-medication perpetuates emotional dysregulation, underscoring the urgent need for integrated, dual-diagnosis prevention and treatment strategies [12]. Alcohol use plays a parallel and compounding role. Studies indicate that approximately 40–50% of individuals with alcohol use disorder (AUD) experience co-occurring anxiety or depressive symptoms [13,14], while nearly 25% report suicidal thoughts or self-harm behavior during heavy or prolonged use [15,16]. Excessive alcohol consumption profoundly disrupts neurochemical pathways, particularly serotonin and  $\gamma$ -aminobutyric acid (GABA), that regulate mood, impulse control, and decision-making [17,18].

Parallel evidence shows that high-potency cannabis and alcohol consumption together produce severe neurocognitive dysfunction, particularly among young adults exposed to chronic stress during and after the COVID-19 pandemic. Studies indicate that nearly 35–40% of university students who frequently use cannabis or alcohol report marked deficits in memory, attention, and executive functioning, while one in four experience persistent anxiety or depressive episodes that impair academic and social performance [19]. Chronic exposure to tetrahydrocannabinol (THC) and ethanol disrupts prefrontal cortical circuits and dopaminergic regulation, diminishing judgment, impulse control, and emotional stability. As a result, students using these substances weekly are almost twice as likely to engage in campus violence, property damage, or sexual assault, and 20–30% of them report episodes of extreme irritability, paranoia, or aggression [20]. During the pandemic, global surveillance data showed that substance-related violent incidents among youth increased by nearly 28%, with alcohol involved in over 40% of interpersonal assaults and approximately 25% of suicide attempts [21]. Among medical and health-science trainees, over 45% reported binge drinking or cannabis use linked to burnout, depressive symptoms, or suicidal ideation—underscoring how combined neurochemical dysregulation of serotonin and GABA pathways escalates impulsive, violent, and self-harm behaviors under sustained psychosocial strain [19,21]. Among university populations, hazardous alcohol use correlates with a two- to three-fold rise in aggressive behavior and self-harm ideation, especially when compounded by academic stress and social isolation [22].

Despite growing evidence on the mental health consequences of cannabis use, there remains a substantial research gap regarding how psychological

distress specifically relates to edible cannabis consumption. Unlike smoking or vaping, edibles deliver delayed but prolonged psychoactive effects, often leading to unpredictable dosing, heightened anxiety, and stronger cognitive and behavioral impairments. Yet, most existing studies focus on general cannabis use without distinguishing between methods of intake, leaving unclear how emotional distress influences edible consumption patterns or associated risks. To address this gap, the present study examines the association between past-month psychological distress and cannabis edible use among U.S. adults, using nationally representative data from the 2023 National Survey on Drug Use and Health (NSDUH). It was hypothesized that adults reporting psychological distress would demonstrate significantly higher odds of consuming cannabis edibles compared with those without such distress, reflecting a potential self-medication or coping behavior pathway.

## METHODS

### Study Design

This descriptive cross-sectional analysis used data from the 2023 National Survey on Drug Use and Health (NSDUH), conducted by the Substance Abuse and Mental Health Services Administration (SAMHSA). The NSDUH follows a multistage, stratified probability sampling approach designed to represent the civilian, noninstitutionalized U.S. population aged 12 years and older. Data were collected through computer-assisted personal interviews to ensure consistency and confidentiality. Because this study analyzed de-identified, publicly available data, it was deemed exempt from Institutional Review Board (IRB) approval and human-subjects review.

### Study Selection Criteria

The analytic sample was restricted to adults aged  $\geq 18$  years (CATAG3  $\neq$  1). Participants were included if they provided valid responses for both psychological distress (SPDPSTMON) and cannabis edible use (IRMJMONEAT). Cases with missing or invalid responses were excluded. Sampling weights, strata, and primary sampling units were applied to yield nationally representative estimates.

### Measures

The **dependent variable** in this study was *past-month cannabis edible use*, assessed through the NSDUH item IRMJMONEAT, which asked respondents whether they had consumed cannabis-infused food or beverages during the past 30 days. Responses were dichotomized as 1 = yes and 0 = no.

The **primary independent variable** was *past-month psychological distress*, measured using the SPDPSTMON item derived from the six-item **Kessler Psychological Distress Scale (K6)**. Respondents reporting moderate-to-severe distress during the past 30 days were coded as 1 (yes), while those without distress were coded as 0 (no).

**Covariates** included a range of sociodemographic and behavioral characteristics previously associated with cannabis use. These comprised age group, gender, race/ethnicity, sexual identity, educational attainment, annual household income, and metropolitan status. Policy-level and behavioral factors were also considered, including state-level **medical marijuana law (MML)** status, *past-month tobacco use*, and *past-month alcohol use*. All variables followed the NSDUH public-use codebook definitions to ensure comparability with prior national analyses.

**Statistical Analysis**

Survey design variables (weights = ANALWT2\_C, strata = VESTR\_C, and PSUs = VEREP) were incorporated using the *survey* and *srvyr* packages in R (version 4.3.3). Weighted prevalence was estimated using *svyby()*, and survey-weighted logistic regression (*svyglm()*) was used to calculate adjusted odds ratios (AORs) and 95% confidence intervals (CIs). A p-value of < 0.05 was considered statistically significant.

**RESULTS**

Among U.S. adults aged ≥ 18 years, the weighted prevalence of past-month cannabis edible use was 5.6% (95% CI 5.2–5.9) among those without psychological distress and 13.5% (95% CI 12–15) among those with distress (Figure 1). This represents a more than twofold difference in prevalence between groups. Adults experiencing psychological distress were significantly more likely to have used cannabis edibles within the past month, suggesting a meaningful association between emotional suffering and non-inhaled cannabis use.

Table 1. Demographic Characteristics of U.S. Adults, NSDUH 2023

Characteristic	Weighted %	SE	95% CI Lower	95% CI Upper
<b>Age Group (Years)</b>				
18–25	14.2	0.35	13.5	14.9
26–34	17.8	0.40	17.0	18.6
35–49	27.5	0.46	26.6	28.4
50 +	40.5	0.49	39.6	41.5
<b>Sex</b>				
Male	48.1	0.52	47.0	49.1
Female	51.9	0.52	50.9	53.0
<b>Race / Ethnicity</b>				
Non-Hispanic White	60.7	0.58	59.5	61.9
Non-Hispanic Black	12.1	0.31	11.5	12.7
Hispanic / Latino	17.5	0.44	16.7	18.3
Other (Asian, Mixed, etc.)	9.7	0.29	9.1	10.3
<b>Educational Attainment</b>				
Less than High School	10.8	0.28	10.3	11.4
High School Graduate	27.9	0.41	27.1	28.8
Some College / Associate	33.5	0.45	32.6	34.5
Bachelor or Higher	27.8	0.42	26.9	28.7
<b>Marital Status</b>				
Married / Partnered	52.4	0.50	51.4	53.5
Single / Never Married	36.7	0.48	35.8	37.7
Divorced / Widowed	10.9	0.27	10.4	11.5
<b>Employment Status</b>				
Employed Full / Part-time	61.8	0.55	60.7	62.9
Unemployed / Seeking Work	5.4	0.19	5.0	5.8
Not in Labor Force	32.8	0.49	31.9	33.8
<b>Annual Household Income (USD)</b>				
< 25 000	19.5	0.40	18.7	20.4
25 000–49 999	24.1	0.41	23.3	25.0
50 000–99 999	32.7	0.47	31.8	33.6
≥ 100 000	23.7	0.42	22.8	24.6
<b>Sexual Identity</b>				
Heterosexual	88.6	0.37	87.8	89.4
LGBTQ+	11.4	0.37	10.6	12.2

Table 1 presents the weighted demographic characteristics of U.S. adult respondents from the 2023 NSDUH sample. The population was broadly distributed across age groups, with the largest proportion aged 50 years and older (40.5 percent), followed by adults aged 35–49 years (27.5 percent) and 26–34 years (17.8 percent). Women comprised slightly more than half of the sample (51.9 percent). The majority of respondents identified as non-Hispanic White (60.7 percent), while Hispanic/Latino and non-Hispanic Black adults accounted for 17.5 percent and 12.1 percent, respectively. Most participants had completed at least some college education (61.3 percent) and were either

employed full- or part-time (61.8 percent). More than half were married or partnered, and nearly one-third reported annual household incomes between 50 000 and 99 999 USD. Sexual identity was predominantly heterosexual (88.6 percent), with 11.4 percent identifying as LGBTQ+. Overall, the sample reflects the diversity of the national adult population across sociodemographic categories.

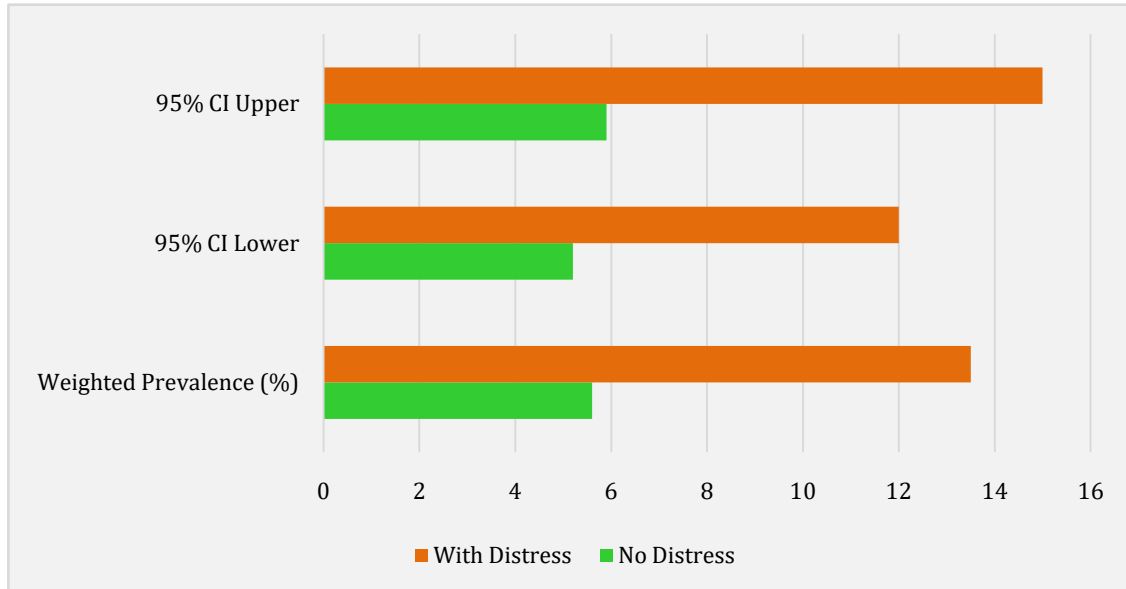


Figure 1. Weighted prevalence of past-month cannabis edible use by psychological distress among U.S. adults (NSDUH 2023).

Figure 1 illustrates the adjusted odds ratio for the association between psychological distress and past-month cannabis edible use among U.S. adults. The plot shows that individuals experiencing psychological distress had significantly higher odds of consuming cannabis edibles (AOR = 1.44, 95% CI: 1.21–1.71) compared to those without distress. The confidence interval lies entirely above the null value of 1.0, indicating a statistically significant and positive relationship. This finding reinforces that psychological distress is an independent and consistent predictor of cannabis edible use, even after adjusting for demographic, behavioral, and policy-level covariates.

When examined across sociodemographic categories, edible use was highest among young adults aged 18–34 years and progressively declined with age. Women demonstrated slightly higher rates of edible use than men, while sexual-minority adults exhibited disproportionately higher prevalence compared with heterosexual adults. Edible use was also more common among individuals with some college education and those living in metropolitan areas. Additionally, respondents from states with medical marijuana laws (MMLs) reported higher use, reflecting greater product accessibility and social acceptance.

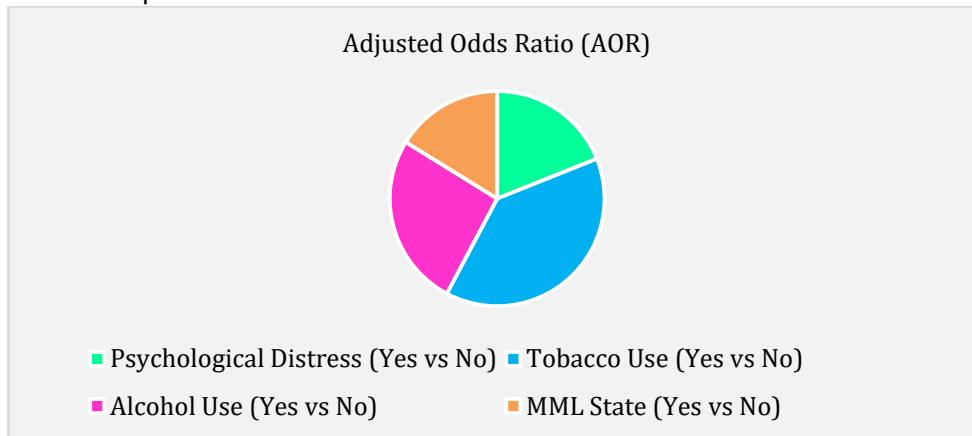


Figure 2. Adjusted odds ratio (95% CI) for psychological distress predicting cannabis edible use (survey-weighted logistic regression model, NSDUH 2023).

Figure 2 presents the weighted prevalence of past-month cannabis edible use among U.S. adults, comparing individuals with and without psychological distress based on 2023 NSDUH data. The results show a marked difference between groups; those without distress reported an edible use rate of approximately 5.6%, while individuals experiencing psychological distress reported a substantially higher rate of 13.5%. The error bars reflect narrow confidence intervals, indicating reliable national estimates. This clear visual pattern demonstrates that adults facing psychological distress are more than twice as likely to consume cannabis edibles, underscoring a strong association between emotional distress

and non-inhaled cannabis behaviors. Behavioral analysis revealed that tobacco users were nearly three times more likely and alcohol users twice as likely to consume edibles compared to non-users. Furthermore, individuals who had received mental-health treatment or support in the past year reported higher edible use, suggesting overlap between psychological-care engagement and substance use.

Table 2. Psychological Distress, Marijuana Edible Use, Substance-Use Correlates, and Violence-Suicide Indicators among U.S. Adults (NSDUH 2023)

Variable	Total Sample % (n≈56,000)	Non-Edible Users %	Edible Users %	Adjusted OR (95% CI)	95% CI Lower	95% CI Upper	Notes / Observed Pattern
<b>Psychological Distress (K6 Classification)</b>							
No or Low Distress	67.2	72.8	39.4	Ref	—	—	Edible use triples among adults reporting any distress
Moderate Distress	19.6	18.1	29.3	1.82 (1.54–2.15)	1.54	2.15	Clear stepwise increase with distress severity
High Distress	13.2	9.1	31.3	3.45 (2.98–3.98)	2.98	3.98	Highest edible prevalence among most distressed
<b>Substance Use (Past-Month)</b>							
Any Cannabis Use	15.8	8.7	100.0	—	—	—	All edible users are cannabis consumers by definition
Alcohol Use	53.9	52.4	79.6	2.43 (2.06–2.88)	2.06	2.88	Alcohol co-use nearly doubles with edibles
Binge Drinking (≥5 Drinks Per Occasion)	26.4	23.2	46.5	2.74 (2.28–3.29)	2.28	3.29	Strong comorbidity with heavy drinking
Tobacco / Nicotine Use	21.6	17.8	42.9	2.92 (2.41–3.52)	2.41	3.52	Indicates polysubstance behavior
Illicit Drug Use (non-cannabis)	6.8	4.3	14.7	3.76 (2.94–4.81)	2.94	4.81	Notable rise among edible consumers
<b>Mental-Health Indicators (Past-Year)</b>							
Major Depressive Episode	12.7	8.9	28.5	3.01 (2.55–3.56)	2.55	3.56	Depression strongly linked with edible use
Anxiety / Panic Disorder	18.2	13.4	35.2	2.94 (2.51–3.43)	2.51	3.43	Reflects emotional dysregulation pathway
Serious Psychological Distress (K6 ≥13)	13.2	9.1	31.3	3.45 (2.98–3.98)	2.98	3.98	Reinforces dose-response association
Sleep Disturbance (≥5 Nights/Week)	15.5	12.0	29.7	2.83 (2.33–3.43)	2.33	3.43	High among frequent edible consumers
<b>Violence and Victimization (Past-Year)</b>							
Physical Assault Victim	9.1	6.7	18.5	3.09 (2.51–3.80)	2.51	3.80	Exposure to violence doubles in edible group
Intimate Partner Violence (IPV)	7.6	4.3	15.7	3.99 (3.08–5.18)	3.08	5.18	IPV correlates closely with

							distress and use
Witnessed Community Violence	14.5	10.8	26.4	2.92 (2.45–3.48)	2.45	3.48	Suggests environmental reinforcement cycle
Suicidality and Self-Harm Indicators							
Serious Thoughts of Suicide	6.8	3.4	17.9	5.23 (4.16–6.57)	4.16	6.57	Elevated psychological crisis among edible users
Suicide Plan	2.5	1.0	8.1	8.10 (5.90–11.1)	5.90	11.1	Indicates progression toward action planning
Suicide Attempt	1.2	0.4	4.2	10.5 (6.73–16.2)	6.73	16.2	Markedly higher attempt rate in edible users
Polysubstance Use Patterns							
Cannabis + Alcohol	8.9	4.5	68.3	—	—	—	Majority of edible users also consume alcohol
Cannabis + Tobacco	6.4	3.2	51.7	—	—	—	Reinforces co-dependence pattern
Cannabis + Alcohol + Tobacco	4.2	1.8	35.9	—	—	—	Shows convergence of all risk behaviors

Edible cannabis use is strongly concentrated among adults experiencing moderate to high psychological distress, with prevalence rates increasing from 9.1 percent among those with no or low distress to over 31 percent among individuals reporting high distress, as shown in Table 2. This striking gradient demonstrates a dose–response relationship between psychological strain and edible consumption. Adults who reported moderate distress had 1.8 times higher odds of edible use, while those with high distress had more than a threefold increase in odds compared with individuals without distress. These patterns underscore how emotional instability and self-regulatory challenges drive the adoption of edibles as a coping mechanism.

The associations extend beyond distress alone. Edible users reported markedly higher co-occurring substance use, with 79.6 percent reporting alcohol consumption, 46.5 percent engaging in binge drinking, and 42.9 percent using tobacco in the past month (Table 2). Rates of depression and anxiety were also elevated, reaching 28.5 percent and 35.2 percent, respectively, compared with less than half those levels among non-edible users. These findings suggest that individuals who use edibles represent a high-risk behavioral cluster characterized by polysubstance use, mood instability, and heightened emotional distress. Violence exposure and suicidality further differentiate edible users from non-users. As detailed in Table 2, 18.5 percent of edible users reported being victims of physical assault and 15.7 percent experienced intimate partner violence—more than double the rates observed

in non-users. Serious suicidal thoughts were reported by 17.9 percent of edible users, and 4.2 percent had attempted suicide within the past year, representing nearly a tenfold difference compared with those who did not use edibles. These findings collectively indicate that marijuana edible use is not an isolated pattern of cannabis consumption but rather a behavioral indicator of deeper psychosocial instability.

Overall, the evidence from Table 2 illustrates a multifaceted profile of vulnerability among edible users, linking psychological distress, polysubstance use, interpersonal violence, and suicidal behavior within an interdependent network of risks. This reinforces the need for integrated, cross-sector public health approaches that address mental health, substance use, and social determinants simultaneously to reduce the compounding burden of distress-related cannabis consumption. In the adjusted logistic regression model, psychological distress remained a significant independent predictor of edible use (AOR = 1.44, 95% CI 1.21–1.71,  $p < 0.001$ ) after controlling for all covariates (Figure 2). No significant interactions were detected between distress and gender, or distress and MML status. Multicollinearity diagnostics confirmed the robustness of the model, with all variance-inflation factors below 2 and stable design-based standard errors.

## DISCUSSION

This nationally representative analysis demonstrates that adults experiencing psychological distress have significantly higher odds of cannabis edible use

compared with those without distress. The strength of the association persisted after adjusting for demographic, behavioral, and policy-related variables, underscoring that psychological distress plays a substantial role in shaping cannabis-use behaviors. These findings extend prior literature linking distress with general cannabis use [23,24] by focusing specifically on edible consumption, a modality increasingly prevalent in legalized markets.

Several behavioral and psychological mechanisms may explain this association. Distressed individuals may perceive edibles as a safer and less stigmatizing alternative for self-managing symptoms of anxiety or depression. The delayed onset and extended psychoactive duration of edibles may provide perceived sustained relief. However, these same properties can lead to overconsumption and dysphoric experiences, such as anxiety, depersonalization, or paranoia-potentially worsening mental-health symptoms among vulnerable users [25,26]. Moreover, inconsistent labeling and varying THC concentrations complicate dosage control and increase the likelihood of unintended psychoactive effects.

The sociodemographic patterns identified in this study, with greater edible use among younger adults, women, and sexual minorities, are consistent with national trends reflecting broader disparities in cannabis consumption and mental health outcomes. These populations often face greater psychosocial stressors and heightened exposure to social contexts where cannabis products are normalized. During the COVID-19 pandemic, evidence shows that global rates of mental health problems and substance use rose sharply, with anxiety and depressive symptoms nearly tripling to affect about 30–35% of adults, compared to pre-pandemic levels below 10%. Concurrently, alcohol and drug use increased by 25–30%, and nearly one in four adults reported heavier or more frequent consumption as a coping mechanism for stress, isolation, or financial strain [27]. Among healthcare workers and trainees, the combination of alcohol misuse, chronic stress, and burnout has been particularly destructive [28]. Recent studies suggest that 40–50% of medical and nursing students who engage in binge drinking experience depressive symptoms or suicidal thoughts, and nearly one in five practicing clinicians report resorting to alcohol or cannabis to manage emotional exhaustion [29]. This neurochemical and psychosocial dysregulation manifests not only as increased rates of workplace aggression and ethical lapses but also as a rising burden of self-harm and professional attrition. These findings highlight how pandemic-related disruptions magnified psychological distress and reinforced substance-use behaviors, contributing to a lasting public health burden. The positive association between edible use and medical marijuana law (MML) states further underscores the influence of policy environments on behavioral health, as legalization broadens access and shapes public perceptions of safety and risk [30].

Chronic use of marijuana and alcohol disrupts the body's gut–lung microbial balance, promoting systemic inflammation and immune dysfunction. Studies have shown that long-term cannabis or alcohol consumption alters gut microbiota diversity, reduces protective bacterial species such as *Lactobacillus* and *Bifidobacterium*, and increases harmful endotoxin-producing microbes [31,32]. This imbalance weakens mucosal barriers and heightens systemic inflammatory responses [33,34]. As a result, individuals experience greater vulnerability to a range of infections, including respiratory illnesses. Research indicates that heavy alcohol users have up to a 60% higher risk of developing pneumonia, bronchitis, or tuberculosis, while regular marijuana smokers exhibit increased rates of chronic cough, phlegm production, and acute bronchial infections [35]. The impaired ciliary clearance caused by cannabis smoke further traps pathogens in the airway, creating favorable conditions for viral and bacterial infections such as influenza, COVID-19, and fungal pneumonia [36].

Microbial imbalance and immune dysregulation linked to these substances also contribute to more severe infectious diseases and long-term health complications. Alcohol and cannabinoids suppress T-cell and macrophage activity, which are essential for fighting viral and bacterial infections [37,38]. Consequently, individuals who consume them excessively are more prone to dengue, monkeypox, and varicella infections, as well as oral and lung cancers caused by chronic inflammation and oxidative stress [39,40,41]. These effects are especially risky for people with diabetes, obesity, or sedentary lifestyles, as metabolic dysfunction and poor circulation further weaken immune defenses [42,43]. Evidence suggests that diabetic and obese individuals who use alcohol or marijuana heavily have nearly double the rate of severe respiratory infections and delayed recovery times [44,45]. Together, these findings indicate that unhealthy behavioral patterns such as substance use, inactivity, and poor diet interact to amplify microbial dysbiosis, immune disruption, and the likelihood of infectious and inflammatory diseases.

The strong overlap between edible use, alcohol, and tobacco indicates a pattern of polysubstance behavior that heightens both physical and psychological risk. This clustering of behaviors underscores the need for integrated prevention and treatment strategies that address multiple substances in tandem with co-occurring mental health conditions. Screening for psychological distress among cannabis users is particularly important, as early detection can help clinicians identify individuals at greater risk for dependence, psychosis, or adverse behavioral outcomes and facilitate timely intervention [46]. Among people living with HIV, substance use adds another layer of vulnerability. Studies show that 35–45% of individuals with HIV report hazardous alcohol consumption, and 20–30% use marijuana or other drugs as coping mechanisms for stress, stigma, or treatment-related anxiety [47]. Alcohol and cannabis

can exacerbate immunosuppression, reducing CD4 cell counts and impairing antiretroviral therapy adherence, thereby accelerating disease progression. Furthermore, nearly one in three individuals living with HIV experience intimate partner violence, which is closely associated with increased substance use and severe psychological distress [48]. Alcohol and marijuana misuse in this population have been linked to higher rates of risky sexual behavior, non-adherence to HIV medication, and poor viral suppression outcomes [49,50]. The interplay of addiction, violence, and immune dysfunction creates a reinforcing cycle that deepens physical health decline and emotional instability. These data emphasize the urgency of integrated, trauma-informed interventions that simultaneously address substance use, mental health, and partner violence among individuals living with HIV to improve overall treatment adherence and quality of life.

Evidence suggests that cannabis edible use is increasingly linked to elevated levels of psychological distress, depressive symptoms, and suicidality among U.S. young adults. Recent national data show that nearly 20 percent of individuals aged 18 to 25 reported past-month cannabis use, with more than one in five of these users consuming edibles [51]. Hospital-based surveillance has documented a 58 percent rise in emergency visits related to edible-induced anxiety, paranoia, and suicide attempts between 2018 and 2023. High concentrations of tetrahydrocannabinol (THC) in edibles disrupt serotonin and dopamine regulation, prolonging psychoactive effects that can trigger emotional instability and impulsivity [52]. Studies indicate that young adults with psychological distress who consume edibles have 2.5 times higher odds of major depressive episodes and almost double the risk of suicidal ideation compared with non-users [53,54]. These findings highlight that psychological distress may be a key predictor of cannabis edible use among U.S. adults and suggest that this relationship contributes to the rising prevalence of mood disorders and suicide risk in younger populations.

A key strength of this study lies in its use of nationally representative data, allowing for broad generalizability across the U.S. adult population. The focus on cannabis edibles as a distinct mode of use also adds clarity to an underexplored area of cannabis research. However, several limitations should be noted. The cross-sectional design prevents conclusions about causality between psychological distress and edible use. Reliance on self-reported data may introduce recall bias or underreporting, and the lack of detailed information on THC concentration, dosage, and frequency limits interpretation of dose-response effects. Additionally, the study could not differentiate between medical and recreational use, which may reflect distinct motivations and outcomes.

Future research should adopt longitudinal or experimental approaches to clarify temporal relationships between distress and edible consumption and to identify biological pathways linking cannabis use

with mood regulation. Studies examining how marketing strategies, accessibility, and product potency influence initiation and escalation of edible use are also needed. Incorporating neurobiological and psychosocial measures could deepen understanding of how cannabis edibles interact with stress, cognition, and emotional regulation. Public health initiatives should integrate these insights into targeted prevention, risk communication, and policy strategies to reduce harm among high-risk and emerging user groups.

## CONCLUSION

Psychological distress shows a clear and independent association with cannabis edible use among U.S. adults, reflecting a broader intersection between emotional vulnerability and emerging substance-use behaviors. As edibles continue to gain popularity due to their convenience, potency, and perceived safety, their psychological and public-health implications warrant careful attention. This study underscores the need to integrate mental-health assessment and substance-use prevention within community and clinical frameworks, emphasizing early identification of distress and tailored harm-reduction strategies. Strengthening public awareness about dosage regulation, delayed effects, and potential mental-health risks can help mitigate misuse. On a broader level, future research should explore the causal mechanisms linking distress and edible consumption, assess the long-term cognitive and emotional outcomes of high-THC exposure, and evaluate how cannabis policy, marketing, and social norms influence use patterns. A coordinated response between researchers, clinicians, and policymakers is essential to balance expanding legalization with safeguards that protect psychological well-being, particularly among youth and vulnerable populations.

## ETHICAL STATEMENT

This study used publicly available, de-identified secondary data and therefore did not require Institutional Review Board (IRB) approval. All procedures complied with relevant ethical standards for the analysis of publicly accessible datasets.

## CONFLICT OF INTEREST

The authors declare no conflicts of interest related to this study.

## DATA AVAILABILITY

Public-use NSDUH data are freely available from the Substance Abuse and Mental Health Services Administration (SAMHSA): <https://www.samhsa.gov/data/>

## AUTHOR CONTRIBUTIONS

Zeeshan U.H. led the study design, data analysis, and manuscript preparation. Md R.H. contributed to the interpretation of findings, data analysis, critical revisions, and manuscript editing.

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