Research Article

Age and Sexual Orientation Differences in Perceptions of the Harms and Benefits of Cannabis Among Adults in the United States

Cannabis
2026
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researchmj.org
10.26828/cannabis/2026/000405

Derek S. Falk[1], Christian A. Adeleke[2], & Briana L. McGeough[3]
[1]TSET Health Promotion Research Center, Stephenson Career Center, The University of Oklahoma Health Campus
[2]School of Social Work, The University of Texas at Arlington
[3]School of Social Welfare, The University of Kansas

ABSTRACT

Objective: Research on how public perceptions of cannabis vary across adulthood and by sexual orientation remains limited despite expanding legalization in the U.S. **Method:** Using 2024 Health Information National Trends Survey (HINTS) data (N = 4,402), we analyzed perceived harms or benefits of cannabis on a six-point scale from "very harmful" to "very beneficial." Weighted ordinal logistic regression assessed associations with age and sexual orientation, adjusting for demographics, health status, and psychological distress. **Results:** 17.7% viewed cannabis as very harmful, 9.8% somewhat harmful, 29.5% both harmful and beneficial, 10.8% neither harmful nor beneficial, 20.2% somewhat beneficial, and 12.0% very beneficial. Younger adults (aged 18–29) were more likely to hold favorable views than those aged 65+ (AOR = 2.32; 95% CI [1.62, 3.33]). Lesbian/gay (AOR = 1.68; 95% CI [1.10, 2.58]) and bisexual (AOR = 1.81; 95% CI [1.06, 3.06]) adults were more likely to hold favorable views than straight adults. The association between sexual orientation and cannabis-related perceptions varied by age (age × sexual orientation: Wald $F(6, 44) = 3.07$, $p = .013$). Among bisexual adults, perceived cannabis benefits increased sharply with age, from approximately 38% at ages 30–44 to 79% at ages 45–64 and 96% at age 65+, while perceived harms decreased from approximately 22% at ages 30–44 to 4% at ages 45–64 and 1% at age 65+. **Conclusions:** Cannabis perceptions vary significantly by age and sexual orientation suggesting intervention strategies should be tailored to reflect diverse views held across the life course and by sexual identity.

Key words: cannabis perceptions; age differences; sexual orientation; ordinal logistic regression

The social and policy context surrounding cannabis use in the United States (U.S.) has shifted dramatically over the past two decades. An increasing number of states have legalized cannabis for medical and recreational purposes, contributing to broader normalization of cannabis use in public discourse, news media, and popular culture (McGinty et al., 2016; McGinty et al., 2017; Mikos & Kam, 2019). These policy changes have coincided with sustained shifts in public attitudes toward cannabis, including growing support for legalization and declining perceptions of risk (Chiu et al., 2022). Contemporary debates increasingly emphasize potential therapeutic benefits alongside concerns about health and social harms, reflecting a more nuanced and sometimes ambivalent public understanding of cannabis use (Hall, 2020; Resko et al., 2019). Recent federal-level developments, including reclassification of cannabis under the Controlled Substances Act, further highlight the evolving legal status of cannabis in the U.S. (Knopf, 2026).

Corresponding Author: Derek S. Falk, PhD, MSW, TSET Health Promotion Research Center, Stephenson Cancer Center, The University of Oklahoma Health Campus, Oklahoma City, Oklahoma, 73104. Phone: (405) 271-1977. Email: derek-falk@ou.edu

Within this changing landscape, public perceptions of harms and benefits of cannabis play a critical role in shaping individual use behaviors, public support for policy initiatives, and engagement with harm reduction and informed health communication efforts, making them a key focus for population-level research.

Perceptions of cannabis-related harms and benefits are key determinants of substance use behavior across the life course. Lower perceived risk and greater perceived benefit have been consistently associated with earlier initiation, more frequent use, and higher-risk patterns of cannabis consumption (Burrow-Sánchez & Cohen, 2025; Martinez et al., 2025). Population-level shifts toward viewing cannabis as less harmful have paralleled increases in use not only among adolescents and young adults, but also among middle-aged and older adults, highlighting the importance of perceptions beyond traditionally studied age groups (Burrow-Sánchez & Cohen, 2025; Martinez et al., 2025). Aside from individual behavior, perceptions shape how individuals engage with prevention messaging, interpret public health guidance, and communicate with clinicians about cannabis use. When perceived benefits outweigh perceived risks, individuals may be less receptive to prevention-oriented messaging or may frame cannabis use as a health-promoting or coping behavior, demonstrating the central role of perceptions in public health and clinical contexts.

Despite the importance of cannabis-related perceptions, prior research has been limited in several ways. Much of the literature has focused on prevalence trends, policy impacts, or downstream health outcomes, often treating perceptions as secondary or explanatory variables rather than as outcomes of interest (Goodman & Hammond, 2022; Harrison et al., 2024). When perceptions are examined directly, they are frequently dichotomized as harmful versus not harmful, obscuring ambivalence and more nuanced views in which cannabis is perceived as both harmful and beneficial (Kvillemo et al., 2022). Research has also disproportionately emphasized adolescents and young adults, with comparatively little attention to perceptions among middle-aged and older adults, despite evidence of evolving use patterns across adulthood (Martinez et al., 2025). Finally, there is limited national evidence examining heterogeneity in cannabis perceptions by sexual orientation and age, particularly analyses that consider how these dimensions intersect over the life course.

Social norms and perceived acceptability are central determinants of substance-related beliefs and behaviors and are particularly salient among sexual minoritized (SM) populations. Beyond individual perceptions of risks and benefits, descriptive norms (beliefs about how commonly cannabis is used) and injunctive norms (beliefs about the social acceptability of use) influence attitudes toward cannabis and subsequent use behaviors. Minority stress frameworks suggest that stigma, discrimination, and social exclusion shape not only coping-related motivations for substance use but also the social environments in which substance-related norms are formed and reinforced (Hatzenbuehler, 2009; Mereish, 2024; Mereish et al., 2017). Consequently, SM individuals may develop distinct perceptions of cannabis harms and benefits through social networks, community norms, adaptive coping processes, and other social and cultural experiences that shape beliefs about cannabis use. Perceived harms and benefits represent cognitive components of substance-related norms because they reflect individuals' beliefs about the expected consequences and acceptability of cannabis use, thereby shaping decisions to initiate, continue, or avoid use.

Nationally representative evidence indicates that approximately 29.4% of SM adults report past-month cannabis use compared with 10.7% of heterosexual adults, with the largest disparities observed among bisexual adults. Among women, past-year cannabis use has been reported by 40.0% of bisexual women and 26.1% of lesbian women, compared with 10.3% of heterosexual women (Dyar, 2022). Among men, prevalence estimates are similarly elevated among bisexual (30.2%) and gay (29.1%) men relative to heterosexual men (17.0%; Dyar, 2022). Beyond differences in prevalence, SM adults also report lower perceived risks, greater perceived benefits, and more permissive cannabis-related social norms than heterosexual adults, suggesting that cannabis-related perceptions themselves represent important public health outcomes rather than merely correlates of cannabis use (Dyar, 2022; Romm et al., 2023). Bisexual adults frequently experience unique forms of stigma,

including bisexual erasure and discrimination from both heterosexual and SM communities, which may contribute to distinct social norms, coping strategies, and perceptions surrounding cannabis use (Dyar, 2022; Sikora et al., 2025). These disparities are likely driven by multiple, complementary processes, including minority stress, social norms, community contexts, and cultural experiences that shape beliefs about cannabis use.

Life course and cohort perspectives suggest that adults develop enduring beliefs about cannabis based on the legal, social, and cultural contexts in which they came of age. Older cohorts were socialized during periods of criminalization, anti-drug campaigns, and greater public stigma, whereas younger adults have experienced increasing legalization, medicalization, and social acceptance (Chiu et al., 2022; Lloyd & Striley, 2018). These cohort-specific experiences likely contribute to differences in perceived harms, benefits, and social acceptability that extend beyond chronological age alone. Although cannabis use among middle-aged and older adults has increased substantially in recent years, relatively little research has examined whether perceptions differ across adulthood or whether age modifies associations between sexual orientation and cannabis-related perceptions (Mahvan et al., 2017; Solomon et al., 2021; Wolfe et al., 2023). Accordingly, age should be conceptualized as a life-course and cohort construct rather than simply a demographic covariate when examining cannabis-related beliefs.

Although evidence suggests that both sexual orientation and age are associated with cannabis-related attitudes and behaviors, few nationally representative studies have examined how these characteristics jointly shape perceptions of cannabis harms and benefits. Existing studies typically focus on adolescents or young adults, combine SM populations into a single category, or examine cannabis use rather than perceptions themselves. As a result, little is known about whether differences in perceived harms and benefits vary across adulthood for straight, lesbian/gay, and bisexual adults. Addressing this gap is important because perceptions are modifiable targets for public health communication, clinical counseling, and harm reduction interventions.

The Present Study

Using nationally representative data from the 2024 Health Information National Trends Survey (HINTS) Cycle 7, this study examines perceived harms and benefits of cannabis use among U.S. adults. We first descriptively characterize the sample by cannabis-related perceptions across sociodemographic and health-related characteristics to provide population-level context. Guided by minority stress, social norms, and life course perspectives, our primary hypothesis-driven analyses examine associations between sexual orientation, age, and perceived cannabis harms and benefits. We hypothesized that lesbian/gay and bisexual adults would report more favorable perceptions of cannabis (i.e., lower perceived harms and greater perceived benefits) than straight adults, with bisexual adults exhibiting the most favorable perceptions. We further hypothesized that younger adults would report more favorable perceptions than older adults, reflecting cohort differences in cannabis-related norms and policy environments. Finally, we hypothesized that age would moderate associations between sexual orientation and cannabis-related perceptions, such that differences between sexual orientation groups would vary across adulthood.

METHODS

Data Source

Data were drawn from the HINTS Cycle 7 (2024), a nationally representative, cross-sectional survey of U.S. adults (National Cancer Institute, 2025). The HINTS Cycle 7 used a stratified, address-based sampling design with mailed questionnaires to collect information on health behaviors, beliefs, and psychosocial factors among the civilian, non-institutionalized U.S. population. Survey weights were applied to account for unequal probabilities of selection and nonresponse, yielding nationally representative estimates. The study was deemed exempt from review by our IRB as the data are deidentified and publicly available.

Measures

Perceived harms and benefits of cannabis use. The primary outcome was perceived harms and benefits of cannabis use, assessed using a single HINTS item with six ordered response categories ranging from very harmful to very beneficial. Respondents selecting "don't know" (n = 1,244; 17.1%) or multiple response categories in error (n = 15; 0.2%) were coded as missing. The six-category outcome was analyzed as an ordinal variable, with higher values indicating more favorable perceptions of cannabis use. For descriptive presentation and visualization of predicted probabilities, responses were summarized into broader harmful, ambivalent, and beneficial categories; however, all ordinal regression models retained the original six response categories.

Sociodemographic Characteristics

Age was categorized into four groups (18–29, 30–44, 45–64, and 65+ years) to reflect commonly used developmental and life-course stages in public health research. These categories were selected a priori to facilitate interpretation of age-by-sexual orientation interaction effects and to capture meaningful differences in historical and policy contexts that may shape cannabis-related perceptions across adulthood. Biological sex, or sex assigned at birth, was coded as female or male. Sexual orientation was categorized as straight, lesbian/gay, or bisexual, corresponding to the original coding in the survey. Respondents selecting "something else" (n = 35; 0.5% of the full HINTS sample) were excluded from analyses because the small sample size precluded reliable estimation and because the HINTS does not collect follow-up information regarding specific sexual orientation identities within this category, precluding meaningful classification. Race and ethnicity were classified as non-Hispanic (NH) White, NH Black, Hispanic, NH Asian, and NH Other. Educational attainment was categorized as less than high school, high school graduate, some college, or college graduate or more. Annual household income categories included: <$20,000, $20,000–<$35,000, $35,000–<$50,000, $50,000–<$75,000, $75,000–<$100,000, and $100,000 or more.

Health- and Mental Health-Related Measures

Because psychological distress is associated with both cannabis use and perceptions of cannabis as a coping or therapeutic strategy, self-rated health and psychological distress were included as covariates to reduce potential confounding (Dyar, 2022; Parnes et al., 2024). Self-rated health was assessed using a standard, single-item measure (excellent, very good, good, fair, or poor). Psychological distress was measured using the validated four-item Patient Health Questionnaire (PHQ-4), with higher continuous scores indicating greater distress (Löwe et al., 2010). The PHQ-4 demonstrated excellent internal consistency in this sample (Cronbach's α = .89).

Data Analysis

All analyses accounted for the complex survey design of the HINTS Cycle 7 by incorporating sampling weights to generate nationally representative estimates. We calculated descriptive statistics for the full sample and stratified by perceived harms and benefits of cannabis use. Comparisons presented in Table 1 were descriptive and exploratory and were intended to characterize the study sample; statistical inference was based primarily on the multivariable ordinal logistic regression models rather than the unadjusted descriptive comparisons. We assessed differences across perception categories using survey-adjusted Rao–Scott chi-square tests for categorical variables and Wald tests for continuous variables.

We estimated weighted, ordinal logistic regression models to examine sociodemographic and health-related correlates of perceived harms and benefits of cannabis use. All regression models treated the outcome as a six-level ordinal variable; no categories were collapsed for model estimation. Model 1 included age group, sex, sexual orientation, race/ethnicity, educational attainment, household income, self-rated health, and PHQ-4 score. Model 2 extended Model 1 by including interaction terms between sexual orientation and age group to assess whether age moderated the association between sexual orientation and cannabis perceptions. We also generated adjusted predicted probabilities from the fully specified model to facilitate interpretation of main and interaction effects. We plotted predicted probabilities by age group and

sexual orientation to illustrate differences in the likelihood of perceiving cannabis use as harmful or beneficial.

After restricting the dataset to respondents eligible for the analytic sample and variables included in the regression models, the percentage of missing data was 8.2% for the cannabis perception variable, 8.4% for sex, 13.4% for sexual orientation, 11.5% for race/ethnicity, 8.0% for education, 12.4% for household income, 4.6% for self-rated health, and 6.5% for PHQ-4 score. To evaluate potential nonresponse bias, we compared respondents with observed versus missing cannabis perception data across age group and sexual orientation using Rao–Scott chi-square tests. All statistical tests were two-sided, with statistical significance defined as $p < .05$. We conducted all analyses using survey procedures (e.g., svy) in Stata, version 19.5 (StataCorp, LLC., College Station, TX, USA).

RESULTS

In the full sample ($N = 4,402$), perceptions of cannabis use varied widely (Table 1). Approximately 17.7% of respondents perceived cannabis use as very harmful, 9.8% as somewhat harmful, 29.5% as both harmful and beneficial, 10.8% as neither harmful nor beneficial, 20.2% as somewhat beneficial, and 12.0% as very beneficial.

Table 1. *Sample Distribution and Comparison by Perceived Harms and Benefits of Cannabis Use (N = 4,402)*

	Full Sample	Perceived Harms and Benefits of Cannabis Use						*p*-value†
		Very Harmful	Somewhat Harmful	Both Harmful and Beneficial	Neither Harmful nor Beneficial	Somewhat Beneficial	Very Beneficial	
		n = 905 (17.7%)	*n* = 439 (9.8%)	*n* = 1,349 (29.5%)	*n* = 388 (10.8%)	*n* = 874 (20.2%)	*n* = 447 (12.0%)	
	n (%)	%	%	%	%	%	%	
Age Group (in years)								< .001
18–29	472 (18.8%)	12.9	21.9	16.5	26.6	19.6	22.0	
30–44	1,016 (27.4%)	19.8	20.9	27.0	40.1	27.0	34.3	
45–64	1,457 (35.1%)	39.8	39.6	35.3	23.7	34.2	35.4	
65+	1,457 (18.8%)	27.6	17.6	21.3	9.6	19.1	8.3	
Sex								0.723
Female	2,627 (48.7%)	51.5	48.7	47.1	44.5	48.9	52.0	
Male	1,775 (51.3%)	48.5	51.3	52.9	55.5	51.1	48.0	
Sexual orientation								< .001
Lesbian/gay	154 (3.7%)	0.5	0.7	4.6	6.7	5.2	3.5	
Bisexual	169 (4.6%)	1.1	2.2	4.7	6.2	5.0	9.1	
Straight	4,079 (91.7%)	98.4	97.1	90.7	87.1	89.8	87.5	
Race/ethnicity								< .001
Non-Hispanic White	2,594 (64.9%)	53.9	67.7	67.7	67.5	68.9	62.7	
Non-Hispanic Black	577 (8.6%)	9.7	8.1	6.7	7.1	9.1	12.8	
Hispanic	839 (17.0%)	24.5	13.3	13.9	18.3	15.9	17.0	
Non-Hispanic Asian	227 (5.2%)	9.9	6.4	7.2	3.1	1.3	1.2	
Non-Hispanic Other	165 (4.3%)	2.0	4.5	4.5	4.0	4.8	6.3	
Education level								< .001
Less than high school	178 (4.0%)	6.8	2.1	2.6	3.7	3.9	4.9	
High school graduate	613 (19.3%)	23.5	11.8	12.7	24.2	21.1	28.1	
Some college	1,242 (38.4%)	31.5	35.9	40.9	32.5	39.8	47.3	
College graduate or more	2,369 (38.3%)	38.1	50.1	43.8	39.7	35.2	19.7	
Household income								< .001
<$20,000	562 (11.6%)	17.9	11.4	5.6	10.7	11.2	18.6	
$20,000–<$35,000	485 (10.6%)	13.4	7.3	13.0	8.0	7.5	10.7	
$35,000–<$50,000	542 (11.6%)	14.4	8.7	8.1	12.8	12.1	16.6	
$50,000–<$75,000	743 (15.9%)	14.1	12.9	14.6	18.9	14.7	23.3	
$75,000–<$100,000	586 (12.7%)	13.2	9.3	13.8	9.9	14.0	11.9	
$100,000+	1,484 (37.7%)	27.0	50.4	44.8	39.8	40.4	18.9	
Health status								.071
Excellent	475 (11.4%)	13.0	13.9	12.0	10.5	8.6	11.1	
Very Good	1,556 (36.6%)	31.9	46.6	34.1	43.7	39.5	30.7	
Good	1,618 (35.4%)	34.6	27.8	39.6	34.1	33.7	36.4	

Fair	630 (13.6%)	15.6	10.9	12.3	9.5	15.5	16.4	
Poor	123 (3.0%)	4.8	0.8	2.1	2.2	2.8	5.4	
Patient Health Questionnaire (PHQ)-4 score, *M* (*SE*)	2.4 (0.1)	2.4 (0.3)	1.8 (0.2)	2.1 (0.1)	2.3 (0.2)	2.6 (0.2)	3.4 (0.3)	.007

*Note. N*s represent observed cases, while %s are estimated population proportions using survey weights. *M* = mean, *SE* = jackknife standard error; † *p*-values are Rao–Scott chi-square tests of weighted proportions for categorical variables and survey-adjusted Wald tests for Patient Health Questionnaire (PHQ)-4 scores.

Sociodemographic Differences in Perceived Harms and Benefits of Cannabis Use

Exploratory descriptive analyses suggested that cannabis-related perceptions varied across several sociodemographic characteristics (Table 1). Perceptions differed significantly by age group ($p < .001$). Adults aged 18–29 accounted for 26.6% of respondents who viewed cannabis as neither harmful nor beneficial and 22.0% of those perceiving cannabis as very beneficial, whereas adults aged 45–64 comprised 39.8% of respondents perceiving cannabis as very harmful. Adults aged 65 years and older represented only 8.3% of those endorsing very beneficial perceptions. Perceptions did not differ by sex ($p = .723$), with similar distributions of male and female respondents across all perception categories.

Lesbian/gay and bisexual respondents were more likely than straight respondents to endorse beneficial or ambivalent perceptions of cannabis use ($p < .001$). Straight respondents, on the other hand, accounted for 98.4% of respondents perceiving cannabis as very harmful and 97.1% of those perceiving cannabis as somewhat harmful, whereas bisexual respondents represented 9.1% of those perceiving cannabis as very beneficial despite comprising only 4.6% of the weighted sample.

Cannabis perceptions also varied by race and ethnicity ($p < .001$). NH White respondents were overrepresented among those endorsing somewhat or very beneficial perceptions (68.9% and 62.7%, respectively), while NH Black respondents were more frequently represented among those perceiving cannabis as very beneficial (12.8%). Hispanic respondents were more evenly distributed across perception categories, while NH Asian respondents were disproportionately represented among those perceiving cannabis as very harmful (9.9%) and least represented among those perceiving cannabis as somewhat (1.3%) or very (1.2%) beneficial.

Missing Data

Missingness on the cannabis perception variable differed significantly by both age group ($p < .001$) and sexual orientation ($p = .003$). Respondents with missing cannabis perception data were older on average than those with observed responses (53.9 vs. 47.9 years, respectively), with adults aged 65+ years comprising 49.8% of respondents with missing cannabis perception data compared with 21.4% of respondents with observed data. Missingness was also more common among straight respondents (96.4%) than among lesbian/gay (1.2%) or bisexual (2.4%) respondents. There were no missing data for age.

Health Status and Psychological Distress

Self-rated health status did not differ significantly across perceived effect categories ($p = .071$); however, psychological distress, as measured by the PHQ-4, differed significantly by perception group ($p = .007$). Mean PHQ-4 scores were lowest among respondents perceiving cannabis as somewhat harmful ($M = 1.8$, $SE = 0.2$) and highest among those perceiving cannabis as very beneficial ($M = 3.4$, $SE = 0.3$), indicating greater psychological distress among individuals endorsing more beneficial views of cannabis use.

Multivariable Models Predicting Perceived Effects of Cannabis Use

Table 2 presents weighted ordinal logistic regression models predicting more favorable perceptions of cannabis use. Model 1 includes sociodemographic and health-related covariates, while Model 2 additionally adjusts for interactions between sexual orientation and age group.

Table 2. *Weighted Proportional Odds Ordinal Logistic Regression Models Predicting More Favorable Perceptions of Cannabis Use (N = 4,402)*

	Model 1 aOR, 95% CI	Model 2 aOR, 95% CI
Age Group (ref. = 65+)		
18–29	2.21 (1.60, 3.07)	2.32 (1.62, 3.33)
30–44	2.31 (1.79, 2.99)	2.52 (1.91, 3.32)
45–64	1.46 (1.16, 1.84)	1.42 (1.12, 1.79)
Sex (ref. = Female)		
Male	1.08 (0.86, 1.34)	1.08 (0.87, 1.34)
Sexual orientation (ref. = Straight)		
Lesbian/gay	1.68 (1.10, 2.58)	1.95 (1.12, 3.39)
Bisexual	1.81 (1.06, 3.06)	6.10 (3.64, 10.23)
Race/ethnicity (ref. = Non-Hispanic White)		
Non-Hispanic Black	1.09 (0.80, 1.47)	1.12 (0.83, 1.53)
Hispanic	0.61 (0.44, 0.85)	0.62 (0.45, 0.86)
Non-Hispanic Asian	0.32 (0.23, 0.44)	0.32 (0.23, 0.45)
Non-Hispanic Other	1.42 (0.87, 2.33)	1.42 (0.85, 2.38)
Education level (ref. = College graduate or more)		
Less than high school	1.36 (0.79, 2.33)	1.34 (0.78, 2.30)
High school graduate	1.66 (1.17, 2.36)	1.60 (1.12, 2.26)
Some college	1.65 (1.37, 2.00)	1.63 (1.36, 1.96)
Household income (ref. = $100,000+)		
<$20,000	0.77 (0.50, 1.20)	0.80 (0.51, 1.25)
$20,000–<$35,000	0.76 (0.52, 1.09)	0.78 (0.54, 1.11)
$35,000–<$50,000	1.00 (0.70, 1.42)	1.01 (0.70, 1.47)
$50,000–<$75,000	1.20 (0.88, 1.63)	1.17 (0.87, 1.58)
$75,000–<$100,000	0.90 (0.70, 1.17)	0.93 (0.72, 1.21)
Health status (ref. = Excellent)		
Very Good	1.06 (0.79, 1.42)	1.06 (0.79, 1.43)
Good	1.06 (0.75, 1.49)	1.07 (0.76, 1.50)
Fair	1.07 (0.69, 1.65)	1.10 (0.72, 1.69)
Poor	0.88 (0.28, 2.73)	0.94 (0.30, 2.95)
Patient Health Questionnaire (PHQ)-4 score	1.03 (0.98, 1.09)	1.04 (0.98, 1.09)
Interaction (sexual orientation x age group)		
Lesbian or gay, 18–29	-	0.61 (0.18, 2.07)
Lesbian or gay, 30–44	-	0.59 (0.20, 1.77)
Lesbian or gay, 45–64	-	1.41 (0.59, 3.41)
Bisexual, 18–29	-	0.27 (0.11, 0.64)
Bisexual, 30–44	-	0.15 (0.07, 0.32)
Bisexual, 45–64	-	1.58 (0.24, 10.25)

Note. aOR = adjusted odds ratio; CI = confidence interval.

Main Effects

Compared with adults aged 65 and older, younger respondents had significantly higher odds of endorsing more beneficial perceptions. In the fully adjusted model (Model 2), adults aged 18–29 (adjusted odds ratio [*AOR*] = 2.32, 95% confidence interval [CI] [1.62, 3.33]), 30–44 (*AOR* = 2.52, 95% CI [1.91, 3.32]), and 45–64 (*AOR* = 1.42, 95% CI [1.12, 1.79]) all had greater odds of reporting more favorable views of cannabis use (Table 2). In Model 1, lesbian/gay (*AOR* = 1.68, 95% CI [1.10, 2.58]) and bisexual respondents (*AOR* = 1.81, 95% CI [1.06, 3.06]) had higher odds of endorsing more beneficial perceptions compared with straight respondents. These associations strengthened in Model 2, particularly for bisexual respondents (*AOR* = 6.10, 95% CI [3.64, 10.23]).

Interaction Between Age Group and Sexual Orientation

Model 2 included age group × sexual orientation interaction terms to evaluate whether the association between sexual orientation and perceived cannabis harms and benefits differed across adulthood. The overall interaction was statistically significant (adjusted Wald $F(6, 44) = 3.07$, $p = .013$), indicating that associations between sexual orientation and cannabis-related perceptions varied by age group. Significant interactions were observed for bisexual respondents aged 18–29 ($AOR = 0.27$, 95% CI [0.11, 0.64]) and 30–44 years ($AOR = 0.15$, 95% CI [0.07, 0.32]; Table 2).

Figures 1 and 2 present adjusted predicted probabilities derived from the fully adjusted ordinal logistic regression model to facilitate interpretation of the interaction effects. As shown in Figure 1, the probability of perceiving cannabis as beneficial declined steadily by age group among straight adults, from approximately 36% among those aged 18–29 to 23% among those aged 65 years and older. Among lesbian/gay adults, predicted probabilities remained relatively stable across younger age groups, increased modestly during midlife, and declined among adults aged 65 years and older.

Figure 1. *Adjusted Predicted Probabilities of Perceiving Cannabis Use as Beneficial by Sexual Orientation and Age Group*

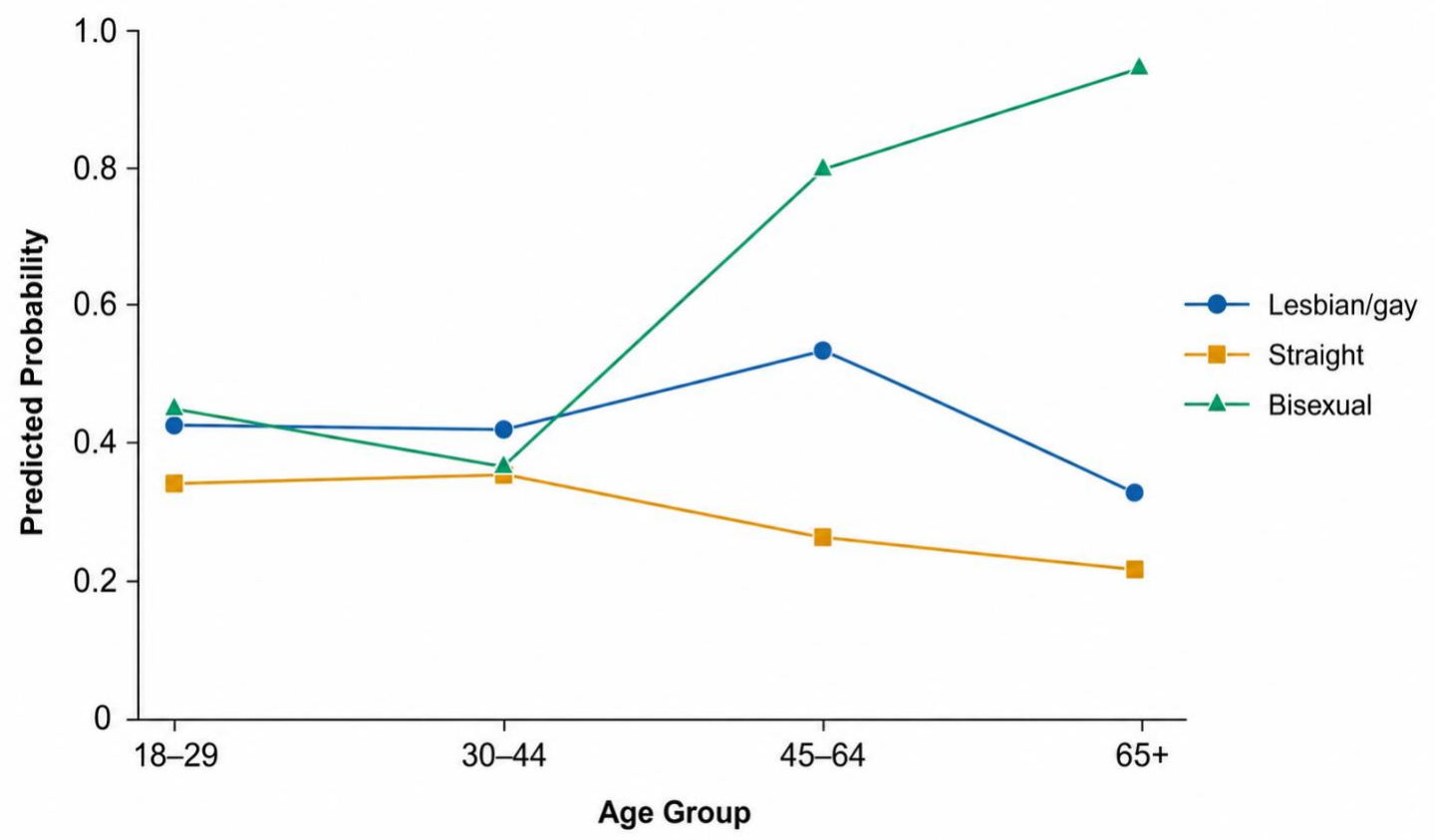
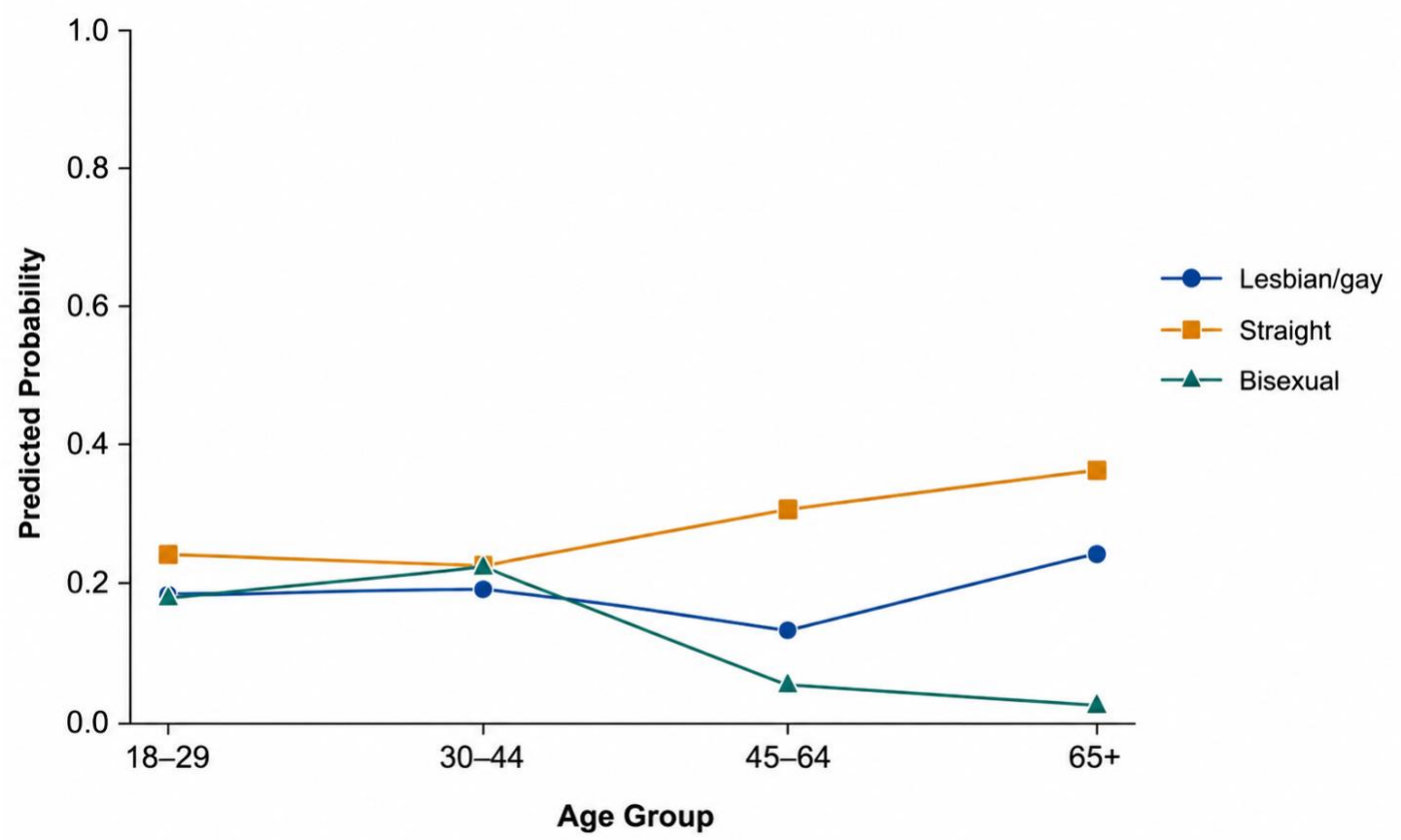


Figure 2. *Adjusted Predicted Probabilities of Perceiving Cannabis Use as Harmful by Sexual Orientation and Age Group*



A similar pattern emerged for harmful perceptions (Figure 2). Among straight adults, the predicted probability of perceiving cannabis as harmful increased with age, rising from approximately 23% among adults aged 18–29 years to 37% among those aged 65 years and older. Lesbian/gay adults exhibited comparatively stable probabilities across age groups. In contrast, bisexual adults showed a markedly different pattern across age. The predicted probability of perceiving cannabis as beneficial increased from approximately 38% among those aged 30–44 years to 79% among those aged 45–64 years and 96% among adults aged 65 years and older. Conversely, the predicted probability of perceiving cannabis as harmful declined from approximately 22% among those aged 30–44 years to 4% among those aged 45–64 years and 1% among adults aged 65 years and older.

DISCUSSION

Using nationally representative data from the HINTS Cycle 7 (2024), this study examined heterogeneity in perceived harms and benefits of cannabis use across age and sexual orientation among U.S. adults. Perceptions of cannabis were highly heterogeneous, with substantial proportions of the population endorsing harmful, beneficial, and ambivalent views. Consistent with prior research, younger adults were more likely than older adults to perceive cannabis use as beneficial, whereas older adults were more likely to perceive it as harmful, reflecting enduring cohort and life-course differences in cannabis-related attitudes (Burrow-Sánchez & Cohen, 2025; Chiu et al., 2022; Martinez et al., 2025). Beyond age, sexual orientation emerged as a key predictor of cannabis-related perceptions, with lesbian/gay and especially bisexual adults exhibiting more favorable perceptions of cannabis than straight adults. Our findings extend those of Romm et al. (2023), who reported sexual orientation differences in perceived cannabis risks and social norms among U.S. young adults, by

demonstrating that these differences are evident across adulthood and vary by age. Interaction analyses and adjusted predicted probabilities further indicated that the association between sexual orientation and cannabis-related perceptions differed across age groups, with the greatest age-related variation observed among bisexual adults.

Age-related differences in perceptions of cannabis use likely reflect both life-course and cohort effects. Older adults in the U.S. were socialized during periods of heightened criminalization, stigma, and punitive drug enforcement, which may contribute to their greater likelihood of perceiving cannabis as harmful (Chiu et al., 2022; Lloyd & Striley, 2018; Mahvan et al., 2017; Solomon et al., 2021; Wolfe et al., 2023; Yarnell et al., 2020). These historical contexts limited exposure to medical framing and cultural normalization, reinforcing negative perceptions and cautious attitudes toward cannabis use (Hall, 2020; McGinty et al., 2016; Mikos & Kam, 2019; Murray et al., 2026). In contrast, younger cohorts have grown up amid widespread legalization, increased public discussion of therapeutic benefits, and broader cultural normalization of cannabis, leading to more favorable or ambivalent perceptions (Chiu et al., 2022; Knopf, 2026; Resko et al., 2019). These age gradients highlight the importance of tailoring prevention and risk communication strategies to distinct adult cohorts, recognizing that older adults may respond more to messages emphasizing potential harms and safety considerations, whereas younger adults may require messaging that balances potential benefits with evidence-based risk information (Dyar, 2022; Dyar et al., 2019; Parnes et al., 2024; Romm et al., 2023; Schofield et al., 2023; Sikora et al., 2025). By situating perceptions within historical and sociocultural contexts, these findings highlight the need for life-course-relevant approaches to public health messaging around cannabis use.

Sexual orientation also emerged as a key predictor of cannabis-related perceptions, with lesbian/gay and especially bisexual adults exhibiting more favorable perceptions of cannabis than their heterosexual peers. These findings are consistent with theoretical and empirical work suggesting that substance-related norms, including perceptions of acceptability, expected benefits, and perceived risks, represent important mechanisms through which minority stress and social environments influence substance-related beliefs and behaviors (Hatzenbuehler, 2009; Mereish, 2024; Mereish et al., 2017). These normative beliefs may shape how SM adults evaluate cannabis use, interpret public health messages, and make decisions regarding cannabis initiation or continued use. Differences in social networks, community norms, and exposure to affirming environments may therefore contribute to more favorable perceptions of cannabis among SM adults, independent of cannabis use itself. Although minority stress remains an important framework for understanding substance use disparities, these differences are also likely shaped by broader social and cultural contexts. For example, cannabis use may facilitate social inclusion, community connectedness, or participation in shared social spaces among some SM populations (Hawkins et al., 2019). Cannabis may also be used within specific relational or sexual contexts that shape perceptions of its benefits and acceptability (Parent et al., 2021). These findings suggest that cannabis-related perceptions are influenced by an interplay of minority stress, social norms, community contexts, and lived experiences rather than by coping-related processes alone. These multiple pathways may reinforce more favorable perceptions of cannabis as a means of relaxation, stress reduction, social connection, or enhanced interpersonal experiences (Dyar, 2022; Dyar et al., 2019; Parnes et al., 2024; Schofield et al., 2023; Sikora et al., 2025).

Our findings also revealed distinct age-related patterns among bisexual adults, whose likelihood of perceiving cannabis as beneficial increased during midlife and older adulthood, whereas perceived harms declined. These findings should also be interpreted considering potential cohort effects related to sexual orientation identity and disclosure. Older SM adults came of age during periods characterized by greater stigma toward SM identities, criminalization of same-sex relationships, and the HIV/AIDS epidemic, all of which may have influenced decisions regarding identity disclosure, community affiliation, and social network formation (Rosenfeld & Ramirez-Valles, 2024). Older adults who openly identified as lesbian, gay, or bisexual may therefore represent a more selective subgroup whose social

environments, community connections, and attitudes toward cannabis differ from those of younger SM adults. In contrast, younger cohorts have come of age during periods of greater societal acceptance of diverse sexual orientations, with increasing numbers of individuals identifying as bisexual and other plurisexual identities (Fish, 2020). These cohort-specific differences in identity development, disclosure, and community participation may partially explain the age-related heterogeneity observed in cannabis-related perceptions and should be considered when interpreting these findings. Although these interaction findings should be interpreted cautiously given the relatively small number of older bisexual respondents, they suggest that the intersection of life-course experiences, minority stress, and evolving social norms may shape cannabis-related perceptions differently across sexual orientation groups.

Public Health and Clinical Implications

The findings of this study highlight the need for nuanced public health and clinical approaches to cannabis communication that acknowledge the widespread ambivalence in perceptions of harms and benefits. Messaging that frames cannabis use as exclusively harmful or beneficial may fail to resonate with individuals who recognize both potential risks and perceived therapeutic or coping-related benefits. Public health campaigns and clinical counseling should adopt balanced, evidence-based strategies tailored to age and sexual orientation. Evidence suggests that substance use disparities among lesbian, gay, and bisexual adults vary across the life course, with differences in prevalence and patterns by age group, highlighting the importance of developmentally responsive approaches (Schuler et al., 2019). Younger adults, older adults, and SM populations may differ not only in their perceptions of cannabis but also in the social meanings, motivations, and normative contexts surrounding its use.

One promising strategy for translating these findings into practice is the use of personalized normative feedback (PNF) interventions. PNF interventions address normative misperceptions by providing individualized feedback that compares an individual's beliefs and behaviors with empirically derived normative information. Among young adults and college students, cannabis-focused PNF interventions have demonstrated reductions in cannabis use and related consequences by correcting normative misperceptions and promoting protective behavioral strategies (Fetterling et al., 2021; Riggs et al., 2018). Our findings suggest that tailoring normative feedback to reflect age- and sexual orientation-specific perceptions of cannabis may further enhance the relevance and effectiveness of these interventions, particularly among SM populations whose perceived harms, perceived benefits, and normative beliefs about cannabis differ from those of heterosexual adults. Such approaches could complement broader harm reduction and clinical counseling efforts by delivering more personalized, contextually relevant, and culturally responsive risk communication.

For SM adults, particularly bisexual individuals who exhibited distinct age-related patterns in this study, mental health services that address minority stress, coping motives, and substance-related social norms may be especially relevant. Affirmative, minority stress–informed interventions, such as LGBQ-affirmative cognitive-behavioral therapy shown to improve mental and sexual health outcomes among young gay and bisexual men, provide a useful model for integrating identity-responsive approaches into substance use prevention and counseling (Pachankis et al., 2022). Similarly, discussions with older adults should consider age-related physiological vulnerability, medication interactions, and evolving patterns of cannabis use across the life course. These considerations extend to digital health and communication platforms, including social media and patient portals, which offer opportunities to deliver age- and identity-responsive messaging, enhance engagement, and improve the effectiveness of prevention, risk communication, and personalized normative interventions among diverse and potentially underserved populations.

Strengths and Limitations

This study has several strengths. It draws on nationally representative data from the 2024 HINTS Cycle 7, enhancing the generalizability of findings to the U.S. adult population. The use of multidimensional measures capturing both

perceived harms and benefits of cannabis use allows for a more nuanced assessment of substance-related perceptions than single-item indicators. Analytically, the application of ordinal regression models and interaction analyses enables the identification of heterogeneous associations across age and sexual orientation, while visualization of predicted probabilities facilitates interpretation of complex interaction effects.

Several limitations should also be considered. The cross-sectional design precludes causal inference regarding the directionality of associations between age, sexual orientation, and cannabis-related perceptions. Perceptions are self-reported and may be influenced by social desirability or recall bias. Sample sizes for several age-by-sexual orientation subgroups, particularly bisexual adults aged 65 years and over (n = 17), were modest, reducing statistical power and the precision of interaction estimates. These interaction findings should be interpreted cautiously and warrant replication in larger samples of SM adults. Because missingness on the cannabis perception item differed by age and sexual orientation, complete-case analyses may be susceptible to selection bias despite the use of survey weights. Additionally, the HINTS does not assess frequency, intensity, or contextual factors of cannabis use, limiting the ability to link perceptions to specific patterns of use, consequences, or experiential contexts. Finally, because the HINTS does not ask about gender identity, this study was unable to explore how perceptions of cannabis use may differ for participants who are transgender/gender diverse (relative to cisgender respondents) and how gender identity may intersect with sexual orientation or age.

Directions for Future Research

Future research should employ longitudinal designs to examine how cannabis-related perceptions evolve over time and across the life course, particularly as legalization and social norms continue to change. Qualitative studies could provide deeper insight into the meanings and lived experiences underlying ambivalent or mixed perceptions of cannabis's harms and benefits, especially among SM populations. Further disaggregation of sexual and gender minoritized identities beyond broad categories is needed to better capture heterogeneity in social experiences, stress exposures, and substance-related perceptions. Additional work should also investigate how perceptions translate into actual cannabis use patterns and subsequent health outcomes. Finally, policy-contextual analyses that incorporate state-level cannabis legalization status and regulatory environments would help clarify how broader structural factors shape individual perceptions and behaviors, and clinical intervention studies should evaluate the effectiveness of strategies aimed to shift client perceptions and the associated impact on cannabis use and related health and mental health outcomes.

Conclusion

Understanding heterogeneity in cannabis-related perceptions is critical as cannabis use becomes increasingly normalized across the U.S. This study demonstrates that perceptions of cannabis' harms and benefits are not uniform but vary meaningfully by age and sexual orientation, highlighting the importance of considering these dimensions jointly rather than in isolation. By revealing age × sexual orientation differences in perceived effects, this work demonstrates how life-course processes shape substance-related attitudes across adulthood. These findings point to the need for targeted, equity-informed public health strategies, including harm reduction, risk communication, and clinical counseling approaches that are responsive to the diverse experiences and perceptions of SM populations across the life course.

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Funding and Acknowledgements: No funding was received for this study.

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Early View Date: September 16, 2026

