Cannabis Use Among Muslim American Undergraduates: Private Religiosity, Normative Climates, and Campus Harm-Reduction Implications

Wahiba Abu-Ras

abu-ras@adelphi.edu

Adelphi University

Lighia Akthar

Adelphi University

Research Article

Keywords: Cannabis, Muslim undergraduates, religiosity, social norms, polysubstance use, harm reduction, campus policy, United States

Posted Date: February 16th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-8208203/v1

Additional Declarations: No competing interests reported.

Abstract

Background:
As cannabis laws liberalize across U.S. states, campus norms are shifting. However, little is known about how these changes affect Muslim American undergraduates, particularly in relation to religiosity and immigration background.

Methods:
A cross-sectional online survey was conducted between 2021–2022 with 183 Muslim-identifying undergraduate students. Measures included lifetime and recent cannabis use, a polysubstance co-use index, and predictors such as private and public religiosity, immigrant generation, and sociodemographic. Logistic regressions were used to estimate associations (odds ratios [ORs] and 95% confidence intervals [CIs]). Model fit was assessed, and complete-case analysis was applied.

Results:
Lower private religiosity was associated with higher odds of use (aOR=2.35, 95% CI:1.18–4.67), as was foreign-born status (aOR=1.92, 95% CI:1.01–3.67). Public religiosity and high school location were not significant. Polysubstance involvement was the strongest correlate (aOR=3.84, 95% CI:2.10–7.03). Users reported markedly higher alcohol, cigarette, and hookah use than abstainers (all p<.001).

Conclusions:
Private religiosity may protect against cannabis use, while immigrant status increases vulnerability. Situated within a campus policy context that combines federal Drug-Free Schools requirements with liberal state cannabis laws, these findings highlight how Muslim undergraduates navigate overlapping moral, legal, and social sanctions. From a harm-reduction perspective, results underscore the need for faith-sensitive, non-punitive campus responses that reduce health, social, and disciplinary harms, rather than relying solely on abstinence-based or punitive approaches.

Introduction

The evolving regulatory landscape in the United States has profoundly reshaped societal attitudes and consumption patterns surrounding cannabis, particularly among adolescents and emerging adults in collegiate settings [16]. As of 2024, 24 U.S. states, the District of Columbia, and two territories have legalized adult-use (recreational) cannabis, while 38 states maintain comprehensive medical cannabis programs (Ebling et al., 2024). These evolving legal frameworks underscore the widespread normalization of cannabis use across the United States [11]. Consistent with this trajectory, several studies [18, 42] revisit the normalization thesis and shows how policy change and market availability recast cannabis as ordinary in youth cultures, lowering perceived risk and embedding use within everyday routines These shifts extend beyond administrative reform to reflect a broader cultural reconfiguration in which cannabis is increasingly framed as normative, low-risk, and even therapeutically beneficial [30]. In parallel, state-level heterogeneity (medical vs non-medical legalization, age thresholds, retail availability) and university conduct codes create variable exposure and enforcement contexts for

students; situating campus behaviors within this policy backdrop is therefore essential. In practice, federal Drug-Free Schools requirements maintain on-campus prohibitions regardless of state law, creating normative ambiguity that can shape perceptions of acceptability and reporting (U.S. Department of Education, n.d.).

This transformation is particularly evident on college campuses, where increased access and permissive social norms have contributed to substantial rises in cannabis use [36]. National data indicate that cannabis has become the most used illicit substance among college students, with recent usage rates exceeding 40% on the West Coast and ranging from 35% to 39% in the Northeast, patterns that closely mirror legalization trends [9, 35]. These patterns support the Normalization Thesis, which argues that behaviors once considered deviant, such as cannabis use, are becoming embedded in youth culture [58]. Complementing this perspective, Pennay & Measham, (2016) and Dahl et al., (2025) trace cannabis' movement from subcultural to mainstream meanings among young people and connect those shifts to perceived risk and peer contexts. Because campus prohibitions must also comply with federal Drug-Free Schools requirements, despite permissive state laws, students often receive mixed signals—being legal off campus yet prohibited on campus—which may shape perceived norms, access, and self-reporting.

However, this normalization may not be experienced uniformly. Muslim college students may experience considerable intrapersonal and interpersonal tension when navigating increasingly permissive campus cultures that conflict with Islamic prohibitions on intoxicants [3, 5, 13]. While religiosity is often cited as a protective factor against substance use, recent studies suggest that this relationship is complex and contextually dependent, influenced by individual coping strategies, levels of religious commitment, and the surrounding campus environment [8]. Normalization-focused studies help explain why religiosity's protective effects may vary by setting and salience, given intensified peer-norm pressures in liberalized environments (Dahl et al., 2025). These dynamics highlight the need for faith-sensitive harm reduction and clear policy communication in higher education settings.

Pew Research Center ([PEW, 2025) estimates that Muslims comprise approximately 4.5 million individuals in the United States, with 35% aged 18–29, the typical college-age range, representing about 1.57 million young adults. Given that about 25% of U.S. Muslims are enrolled in college (PEW, 2025), an estimated 394,000 Muslim students currently attend U.S. institutions of higher education. Although national data are not disaggregated by religion, these figures underscore the growing presence of Muslim students on campuses and the need to examine their experiences with cannabis use.

Multiple factors shape cannabis use among Muslim college students, including peer norms, acculturative stress, and harm perceptions. Cannabis normalization within campus environments influences initiation and frequency of use [13], while acculturative stress, linked to bicultural negotiation and discrimination, elevates risk behaviors [3]. Perceived low risk further promotes experimentation [40], and peer norms remain strong predictors of use [42], supporting dialogue-based and normative-misperception interventions. "Situational religiosity" also shapes behavior, reflecting students' selective adherence to religious norms across contexts [23, 28]. These findings challenge abstinence-only or

monolithic prevention models, highlighting the need for culturally grounded strategies that align with lived religious practices.

Despite the increasing prevalence of cannabis use across the United States [26, 49], Muslim Americans remain notably underrepresented in substance use research [5, 13]. Previous studies have indicated that religiosity can serve as a protective factor against substance use [3, 40]; however, the evolving landscape of legal and cultural attitudes necessitates a thorough reassessment of these dynamics [56]. Contemporary normalization frameworks provide a relevant lens for this re-evaluation within university settings [18, 42].

This study aims to update existing prevalence data and apply Social Learning Theory (SLT) [7] and Normative Perception Theory (NPT) to interpret behavioral patterns among Muslim undergraduates. Such insights are pertinent for informing prevention policy in higher education. The analysis will consider various state laws and age restrictions relevant to drug policies, alongside the university's conduct environment, which influences students' perceptions of available opportunities and potential consequences. Previous research has emphasized the importance of understanding how attitudes toward cannabis evolve with legal changes, informing prevention and communication strategies [42].

This study will address gaps in the literature by providing updated estimates of cannabis use among Muslim undergraduates and modeling risk factors within today’s legalization context. We will (1) differentiate between private and public expressions of religiosity to identify which dimension offers greater protective effects in peer-dense environments; (2) quantify polysubstance involvement (including alcohol, tobacco/hookah, and other drugs) to reflect real-world clustering effects that contribute to harm; (3) operationalize acculturation through pragmatic proxies such as immigrant generation and high-school location; and (4) interpret results against the backdrop of discrepancies between state and federal policies that impact campus conduct and student norms. To enhance analytical rigor, we will adjust for confounding factors, such as age (including legal access thresholds of 21 and older), gender, and sociodemographic variables. Conceptually, we will anchor our interpretations within Social Learning and Normative Perception frameworks to elucidate the interactions between peer modeling, perceived norms, and faith commitments. These methodological choices will yield actionable evidence for developing faith-sensitive, harm-reduction strategies and more precise policy communications in higher education settings.

Cannabis Normalization and College Environments

The increasing legalization and normalization of cannabis in the United States have profoundly influenced young adults’ substance use behaviors. College campuses, particularly in states with long-established legalization frameworks, have become critical sites for observing these cultural shifts. National surveys, including Monitoring the Future and assessments by the American College Health Association (ACHA) [26], have consistently documented rising cannabis use among students. In 2023, 42.4% of young adults reported past-year cannabis use, with the highest prevalence, 45.6% among

students aged 23 to 24 [26]. Because universities must also comply with federal Drug-Free Schools and Communities requirements, campus conduct codes can prohibit possession and use even in states with legal retail markets, creating mixed policy signals that shape perceived norms, access, and enforcement risk on campus. This policy–culture interaction aligns with normalization research showing that legal change lowers perceived risk and reframes cannabis as mainstream [42], reinforcing the need to interpret campus behavior within layered state and institutional contexts.

Despite the expanding body of literature on substance use among college students, the experiences of religious minority groups, particularly Muslim students, remain significantly underrepresented. Although Islam unequivocally prohibits intoxicants and religiosity is frequently reported as a protective factor [3, 5], this framing can oversimplify the complex realities faced by Muslim youth. In particular, prior studies often treat religiosity as a single construct and rarely distinguish between private (internal conviction) and public (visible observance) religiosity, a distinction that may be crucial in liberalized campus environments where peer norms intensify [42].

National survey data further support this complexity, demonstrating that while religiosity is associated with abstention from substances, its protective effect is mediated by denominational affiliation, personal religious commitment, and the degree of cultural integration [34]. These findings challenge the effectiveness of abstinence-based prevention models that lack cultural and religious nuance. For policy and services, this implies the need for faith-sensitive harm-reduction and tailored communication strategies rather than generic, abstinence-only approaches. Evidence with college populations also indicates robust normative misperceptions and highlights the value of dialogue-based, nonjudgmental resources on potency and practical risks under legalization [44, 47], aligning with prevention strategies that address norms rather than rely solely on moral messaging.

Although the Normalization Thesis has been widely supported in general student populations, its applicability to religious minorities remains insufficiently explored. Theoretical models, such as social learning theory [7] and normative perception [43, 47], may offer promising frameworks; however, additional empirical inquiry is needed to evaluate their relevance among Muslim students navigating dual normative systems. Educational resources are most effective when they are honest, non-judgmental, and address potency and practical risks in legalization contexts (Jenkins et al., 2023). Accordingly, differentiating between campus-level normative climates and students' religious commitments is essential to interpret use patterns among Muslim undergraduates within heterogeneous state and institutional policy contexts. To that end, two gaps are salient for this population: (a) acculturation is invoked but operationalized inconsistently, few studies use analyzable proxies such as immigrant generation and high-school location alongside religiosity while adjusting for legal-age access (≥ 21) [50] and (b) collegiate cannabis often clusters with alcohol, tobacco/hookah, and other drugs, yet polysubstance involvement is rarely modeled explicitly in religious-minority samples. Addressing these gaps is central to the present study's aims.

Islamic Jurisprudence and Cannabis Use

Building on the normalization context and campus policy misalignment outlined above, Islamic jurisprudence offers a normative frame that many Muslim students use to navigate cannabis-related decisions. Mainstream Sunni and Shi'i positions classify cannabis as ḥarām (forbidden) due to its intoxicating properties and align it with the Qur□ānic prohibition of khamr (alcohol); a frequently cited ḥadīth states, "Whatever intoxicates in large quantities is forbidden in small quantities" [2]. Contemporary juristic guidance in North America reflects this stance: the Fiqh Council of North America (FCNA) prohibits recreational use and permits medical use only under ḍarūra (necessity) and maṣlaḥa (public interest), contingent on clinical oversight and avoidance of psychoactive effects [46]. These rulings reinforce private religiosity (internal conviction) even when public observance varies, a distinction central to this study.

Recent Islamic legal scholarship also emphasizes education over prohibition alone. Qatanani et al. [46] advocate shifting from purely prohibitive fatāwā (legal opinions) to culturally grounded education that helps Muslim youth navigate evolving cannabis markets in Western societies. Abdulrahman [2] highlights the academic, cognitive, and spiritual harms of cannabis and attributes rising use to peer influence, weak mentorship, and limited faith-based prevention. Institutionally, clearer campus guidance on medical-use documentation, product restrictions, and safety expectations may reduce ambiguity for students seeking care while maintaining compliance with the Drug-Free Schools framework, an approach congruent with Screening, Brief Intervention, and Referral to Treatment (SBIRT) and with norms-focused, non-moralizing prevention highlighted earlier.

Empirical data underscore the gap between doctrine and behavior. Among U.S. Muslim college populations, past-year illicit drug use has been reported at 24.6%, with cannabis comprising a substantial share [5]. More recent samples indicate cannabis prevalence of 19.7% among Muslim students [24], and studies of Arab American Muslim young adults show high past-month alcohol (57% men; 41% women) and cannabis use (32.5% men; 8.9% women) [32]. In the broader collegiate context, national surveillance documents high and rising cannabis use [9, 26, 47]. These patterns suggest that prohibitionist messaging alone is unlikely to suffice; instead, faith-informed harm reduction that respects doctrinal values while addressing polysubstance clustering and campus norm dynamics is warranted.

This jurisprudential landscape clarifies why distinguishing between private and public religiosity is analytically necessary (doctrinal conviction vs. visible practice), why acculturation proxies (immigrant generation, high school location) are relevant to how students reconcile dual normative systems, and why modeling polysubstance involvement is essential for realistic risk assessment. By situating individual behavior at the intersection of religious law, peer norms, and policy environments, the present study directly addresses the literature gap. It generates evidence to guide culturally competent, policy-aware prevention on U.S. campuses.

Social Context and Normative Influence

A growing body of literature underscores the importance of peer and institutional influences in shaping substance use behaviors among college students [16, 57]. Perkins and Berkowitz (1986) and Rothstein and Stamates (2025) demonstrated that descriptive norms (perceptions of peer behavior) have a greater impact on cannabis and alcohol co-use than injunctive norms (perceptions of peer approval). Shipley et al. [51] developed the Simultaneous Alcohol and Cannabis Use (SAM) scale, identifying social enhancement and conformity as key motivations, thereby reinforcing the centrality of social context. In legalization settings, mixed policy signals, legal off campus yet prohibited under Drug-Free Schools on campus, can amplify descriptive-norm salience and suppress reporting of injunctive disapproval, particularly in residence-life and peer-network hubs. Normative-feedback interventions that explicitly address misperceptions of peer use show promise in reducing harm, particularly when adapted with faith-sensitive content for religious minority students. Such adaptations align with this study's translation goal of pairing norm correction with SBIRT pathways for students who screen positive.

Among Muslim students, these dynamics are particularly salient due to navigation of both secular and religious cultural spheres. Hashem [23] found that cannabis use persists despite religious prohibitions, influenced by generational shifts in religiosity, liberal campus environments, and strong peer networks. To account for these behavioral discrepancies, researchers have proposed situational religiosity, an adaptation rooted in the frameworks of lived religion [10] and symbolic religiosity. These paradigms highlight how individuals practice religion differently across settings, and how symbolic or communal markers of faith may persist even when public observance diminishes [8, 10]. Mechammil and Cruz's (2021) concept of situational religiosity illustrates how students may practice religious norms in private or familial settings while conforming to prevailing social norms in public or academic contexts. Consistent with our aims, this distinction maps onto the study's operational separation of private religiosity (internal conviction) and public religiosity (visible observance), enabling tests of which dimension better buffers peer effects under liberalized campus norms.

Even in conservative societies, peer influence can override religious doctrine [43, 58]. Mohamud's (2024) study of Muslim adolescents revealed routine use of socially sanctioned substances such as alcohol and khat despite religious bans, mirroring patterns observed among Muslim students in Western universities. A recent jurisprudential review [6] reaffirmed Islam's prohibition of intoxicants but simultaneously advocated for educational interventions that engage youth through culturally grounded dialogue. Together, these studies indicate that doctrinal prescriptions alone are insufficient to counter descriptive-norm pressures; interventions must address peer ecologies, potency- and route-specific risks, and co-use patterns that characterize collegiate settings. For university health services and policymakers, collaborating with Muslim student organizations and chaplaincy/faith leaders to co-design culturally safe materials can improve reach and acceptability while maintaining institutional standards. This collaboration is especially pertinent for clarifying medical-use documentation, product restrictions (e.g., high-potency concentrates), and amnesty/early-help policies, so that students receive unambiguous, culturally competent guidance within the Drug-Free Schools compliance framework.

Cannabis use among Muslim students reflects a complex intersection of peer norms, institutional cultures, and identity negotiation [23]. Navigating liberal campus environments while upholding religious identities creates unique pressures. Accordingly, this study integrates private versus public religiosity, acculturation proxies, and polysubstance involvement within a policy-aware norms framework to examine how peer influence and religiosity interact on contemporary U.S. campuses.

Theoretical Framework

This study employs Akers' Social Learning Theory (SLT) to explain cannabis use among Muslim American undergraduates [7]. SLT identifies four key processes influencing substance use: differential association (exposure to peer modeling), definitions (internal beliefs about use), differential reinforcement (rewards and sanctions), and imitation (observed behaviors). In this context, private religiosity reflects internalized negative definitions and commitments against the use of substances, while public religiosity encompasses visible faith practices shaped by peer influences. Variations in immigrant generation affect social networks and exposure to usage (differential associations), while campus climate influences reinforcement structures (e.g., social approval vs. institutional sanctions).

Normative-misperception literature suggests that students often overestimate peer use/approval, thereby heightening personal risk under social pressure [43]. This illustrates how peer networks and campus messaging can undermine the protective effects of religiosity. Private religiosity aligns with SLT's definition construct, fostering stable negative views towards intoxicants. Public religiosity, while reflecting community participation, may not influence behavior when social reinforcements favor use. Contextual factors also shape the relationship between religiosity, immigrant generation, and cannabis use within varying state laws and university policies, consequently affecting exposure, rewards, and punishments.

This framework justifies (a) separating private from public religiosity in all models; (b) including acculturation proxies to capture exposure pathways; (c) modeling polysubstance as a key correlate and exposure proxy; and (d) probing moderation (private religiosity × exposure) to test whether strong peer ecologies erode protection.

Methods

Study design and participants.

We conducted a cross-sectional, online survey between January 2021 and March 2022 to examine cannabis use and psychosocial correlates among Muslim undergraduates in the United States. Eligibility criteria were: (a) age 18 years or older, (b) current enrollment at a U.S. college or university, and (c) self-identification as Muslim. Recruitment was conducted through purposive outreach via national Muslim Student Association listservs, academic networks, and social media channels. The survey was anonymous, administered on a secure platform, and did not collect personally identifying information.

Participants provided electronic informed consent prior to beginning the survey. The study protocol received approval from the Adelphi University Institutional Review Board (AU-IRB-23-045). Reporting follows best practices for cross-sectional studies (von Elm et al., 2007).

Measures

Sociodemographic and acculturation indicators

Participants reported their age (in years), gender, and ethnic origin (Arab, South Asian, Persian/Middle Eastern, African, or Other, with write-in options available under “Other”). Two indicators served as pragmatic proxies of acculturation exposure.

Nativity was assessed with the question “Were you born in the United States?” and coded as U.S.-born (reference) versus foreign-born; this item captures early-life socialization and language environment [50].

The high school location was assessed with the question, “Where did you complete most of high school?” and coded as either inside the U.S. or outside the U.S.; this item reflects the immediate pre-college socialization context [50]. Because nativity and high school location are conceptually distinct, both were retained in multivariable models. Their cross-tabulation and phi coefficient are reported to document association, and variance inflation factors were examined to verify acceptable multicollinearity.

Participants also reported their language of thought (English, another language, or both), living arrangement (with family, campus housing, off-campus with peers, or other), and whether they received a scholarship. These variables were summarized descriptively and, where relevant, explored in sensitivity analyses.

Substance use

Substance-use items were adapted from the Harvard College Alcohol Study instrument [57] and prior work with Muslim college samples, using the same instruments [3]. Lifetime cannabis use was measured with “Have you ever used cannabis (weed, marijuana, pot)?” (yes/no). Participants endorsing lifetime use were asked about recency (past 30 days, past 12 months, or more than 12 months ago) and typical frequency; these follow-ups were summarized descriptively.

To characterize co-use, participants indicated past use of alcohol, tobacco, hookah, cocaine, club drugs, prescription medications without a prescription or other than prescribed, LSD/mushrooms, methamphetamine, ecstasy, and heroin. A polysubstance index was computed by summing endorsements across these ten categories (excluding cannabis), with higher scores reflecting broader co-use.

Religiosity

Religiosity was operationalized using five items adapted from widely used measures in religion and health research (including the Duke University Religion Index and the Multidimensional Measurement of Religiousness/Spirituality), previously applied in Muslim student populations [3, 5, 29].

Two items captured public religiosity (attendance at religious services; participation in Islamic activities), and three items captured private religiosity (personal importance of belief; influence of religion on daily decisions; spiritual identification). Items used a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) and were oriented so that higher scores indicate greater religiosity. Internal consistency for the composite was good (Cronbach's α = .85). In primary analyses, public and private religiosity were dichotomized, scores of 4–5 classified as "high" and 1–3 as "low", consistent with prior work in Muslim college samples [3, 5]. Sensitivity analyses treated public and private religiosity as continuous scales to assess robustness.

Statistical analysis

Analyses were performed in IBM SPSS Statistics, Version 30. Descriptive statistics summarized sample characteristics, cannabis use, and co-use. Group differences for categorical variables were evaluated using chi-square tests (Fisher's exact tests; Fisher, 1922) when expected cell counts were small.Independent-samples *t*-tests were used for continuous variables.

For multivariable analysis, logistic regression models were estimated with lifetime cannabis use (ever vs. never) as the dependent variable. The modeling sequence proceeded as follows: Model 1 included age and gender; Model 2 added public and private religiosity; Model 3 added nativity and high school location; and Model 4 added the polysubstance index. Estimates are reported as odds ratios with 95% confidence intervals. Model fit was evaluated with the Hosmer–Lemeshow statistic. Multicollinearity was assessed using variance inflation factors; all values were below conventional thresholds. For interpretability, average marginal effects for key predictors are presented in the Supplement. Because state cannabis policy and campus conduct regimes were not measured, we acknowledge this as a contextual limitation in the Discussion.

Missing data

Participants who did not answer the lifetime cannabis item (n = 7) were excluded from primary analyses, and the complete-case sample size is reported for each model. For other variables, cases were retained for descriptive statistics and excluded from multivariable models via listwise deletion if any model variable was missing. Per-variable missing counts and denominators for proportions are provided in table footnotes, and an available case sensitivity table for bivariate associations is included in the Supplement.

Ethics

The study complied with the Declaration of Helsinki and institutional data-protection policies. The Adelphi University Institutional Review Board approved all procedures (AU-IRB-23-045). Participants provided electronic informed consent prior to participation.

Results

Sample characteristics

Table 1 summarizes characteristics of the analytic sample of 183 Muslim undergraduate students drawn from diverse ethnic and national backgrounds. Overall, 55.0% (n = 99) identified as female and 45.0% (n = 81) as male. Among lifetime cannabis users, 54.1% were male and 45.9% were female, compared with 38.4% and 61.6%, respectively, among abstainers; this difference was not statistically significant, $\chi^2(1, N = 183) = 1.94$, $p = .16$, although the higher male proportion among users is consistent with national collegiate trends.

Approximately one-fifth of participants (19.1%, n = 35) completed most of high school outside the United States; the remainder (80.9%, n = 148) graduated from a U.S. high school. With respect to language of thought, 34.6% (n = 45) reported thinking primarily in English and 65.4% (n = 85) in another language or both; 53 cases were missing on this item (see Table 1 for denominators). Participants self-identified as Arab (51.4%, n = 94), South Asian (18.0%, n = 33), [a second South Asia label appears in the raw data; 11.5%, n = 21; corrected/merged in Table 1], Persian/Middle Eastern (8.2%, n = 15), African (6.6%, n = 12), and Other (4.4%, n = 8). Due to sparse cell counts and duplicated labels, ethnic comparisons are presented descriptively only. Regarding nativity, 33.7% (n = 61) were foreign-born and 66.3% (n = 120) U.S.-born; most participants (91.8%, n = 168) reported that both parents were immigrants. Just over one-quarter (25.7%, n = 47) were living with parents at the time of the study. Scholarship support was reported by 36.1% (n = 66).

Consistent with Table 1, most demographic variables, including sex, high-school location, heritage background, primary language, scholarship status, and living arrangement, were not significantly associated with lifetime cannabis use in bivariate analyses.

Cannabis use: Prevalence and bivariate comparisons

In the full sample, 20.2% (n = 37) reported lifetime cannabis use, and 79.8% (n = 146) were lifelong abstainers. Lifetime use did not differ by sex, high-school location, language of thought, parental immigration, living arrangement, or scholarship status (all $p > .05$). In contrast, lifetime use was more common among foreign-born students than U.S.-born students, $\chi^2(1, N = 183) = 4.65$, $p = .031$. This difference reflects an association in this sample and should not be interpreted causally.

As noted in the Methods, nativity and high-school location were used as pragmatic acculturation proxies commonly employed in public health and education research when more comprehensive measures are

unavailable; they capture elements of cultural and educational socialization but not the full complexity of acculturation.

Religiosity

Table 2 presents comparisons of public and private religiosity. Public religiosity, measured by frequency of attendance at religious services and the self-rated importance of participating in religious activities, did not differ significantly between users and abstainers. For example, 20.7% of users and 23.2% of abstainers reported attending services >52 times per year, $\chi^2 = 0.84$, $p = .77$. The importance of religious activities showed a marginal difference ($p = .08$). In contrast, adherence to religious practices differed significantly: 7.1% of users versus 27.0% of abstainers reported adhering "all the time," $\chi^2 = 4.99$, $p = .026$.

Private religiosity showed stronger and more consistent associations. Among users, 48.3% strongly agreed that religious beliefs were an essential part of their life, compared with 73.9% of abstainers, $\chi^2 = 6.99$, $p = .008$. Similarly, 27.6% of users versus 67.0% of abstainers strongly agreed that religious beliefs influenced their decisions, $\chi^2 = 14.75$, $p < .001$. Users were also less likely to strongly agree that it was important for friends to understand their religious beliefs (31.0% vs. 53.6%, $p = .030$). The belief that friends should share one's religious beliefs did not differ significantly ($p = .38$). A composite private-religiosity score was lower among users ($M = 11.28$, $SD = 2.91$) than abstainers ($M = 12.86$, $SD = 2.79$), $t(138) = 2.71$, $p = .004$. Taken together, these patterns indicate that private (internalized) religiosity, rather than public participation, is more closely related to abstention in this sample.

Multivariable analysis

To account for overlapping influences, we estimated a logistic regression with lifetime cannabis use (ever vs. never) as the outcome (Table 3). Predictors were private religiosity, public religiosity, nativity (foreign-born vs. U.S.-born), high-school location (outside vs. inside the U.S.), age, and the polysubstance index. Low private religiosity remained associated with a higher likelihood of lifetime use (OR = 2.35, 95% CI [1.18, 4.67], $p = .015$), net of covariates. Foreign-born students also had a higher likelihood of lifetime use than U.S.-born peers (OR = 1.92, 95% CI [1.01, 3.67], $p = .047$). Public religiosity and high-school location were not significant predictors. The polysubstance index was the strongest correlate; reporting two or more additional substances was associated with nearly a four-fold higher likelihood of lifetime cannabis use (OR = 3.84, 95% CI [2.10, 7.03], $p < .001$). The final model fit was acceptable (Hosmer–Lemeshow $\chi^2 = 6.32$, $p = .39$), and no multicollinearity concerns were detected (all VIFs < 2). Age was not significant in the multivariable model; descriptively, however, nearly half of users were 23–24 years old, a concentration consistent with developmental patterns and legal access thresholds in some U.S. states.

Substance-use patterns

Table 4 details broader substance-use patterns. Relative to abstainers, cannabis users were substantially more likely to report alcohol, tobacco, and hookah use. Ever-alcohol use was reported by 75.7% of users

versus 12.3% of abstainers, $\chi^2 = 62.95$, $p < .001$. Ever-cigarette use was reported by 75.7% of users versus 25.3% of abstainers, $\chi^2 = 32.65$, $p < .001$. Ever-hookah use was reported by 94.6% of users versus 47.6% of abstainers, $\chi^2 = 26.60$, $p < .001$.

Although less common overall, use of other illicit substances was concentrated among cannabis users. Cocaine (8.1% vs. 0%; Fisher's exact $p = .008$), ecstasy (8.1% vs. 0%; $p = .008$), other club drugs (10.8% vs. 0%; $p = .002$), LSD/mushrooms (10.8% vs. 0%; $p = .002$), and methamphetamine (8.1% vs. 0%; $p = .008$) were each more frequently endorsed by users than abstainers. Heroin use was rare (2.8% among users; 0% among abstainers). These findings indicate clustering of alcohol, tobacco, and other drug use among cannabis users in this population.

Notes on robustness and context

Sensitivity analyses (described in the Supplement) treating public and private religiosity as continuous variables yielded the same substantive inferences. Results were also stable when nativity and high school location were entered individually rather than jointly. Because state cannabis policy and campus conduct regimes were not measured, observed associations should be interpreted with consideration of unmeasured contextual heterogeneity.

Discussion

This study examined cannabis use among Muslim undergraduate students in the United States, focusing on its associations with religiosity, acculturation-related variables, and co-occurring substance use. With 20.2% of participants reporting lifetime cannabis use, the findings represent a significant increase from earlier estimates of 1.4% in this population [3]. In addition to this increase, cannabis use in our sample showed apparent clustering with alcohol, tobacco/hookah, and club/illicit or non-medical prescription drugs, underscoring polysubstance risk. This shift is notable within a policy landscape where legalization and changing norms may weaken traditional protective influences of religious identity. Prior research has shown that higher religiosity is associated with reduced alcohol and cannabis use [3, 5] and that religious commitment shapes how Muslim adolescents navigate risk behaviors in the context of discrimination [40]. Within campus environments where federal Drug-Free Schools requirements prohibit cannabis despite state-level legalization, normative ambiguity may emerge, potentially diluting protective influences while students navigate mixed policy signals.

Our results must also be interpreted in consideration of demographic patterns. Nearly half of ever-users were 23–24 years old, suggesting both developmental influences and legal thresholds, as cannabis is permitted for those over 21 in many states. Accordingly, some associations attributed to religiosity or nativity may be partially confounded by age-related access and contemporaneous policy environments. Although gender was not statistically significant in our regression models, descriptive data indicated higher cannabis use among males than females. This aligns with national surveys showing greater prevalence among young men [49] and likely reflects gendered exposure and normative contexts rather

than strong, independent gender effects. These demographic patterns support cautious interpretation of unadjusted differences and underscore the value of adjusted models for policy-relevant inference.

These findings also highlight how legal, social, and cultural transformations are reshaping substance-use patterns among Muslim students. Policy shifts have reframed cannabis from subcultural to mainstream meaning among youth, reinforcing the normalization pathway [20]. National trends likewise show rising adult cannabis use alongside legalization and declining risk perception [14]. Because our dataset did not capture students' states of residence, we could not determine whether cannabis use differed by legalization status. Accordingly, these patterns should be viewed as incomplete with respect to policy exposure and point to the need for analyses linking individual data to state- and campus-level indicators when evaluating policy–religiosity interactions. Pairing such data with campus conduct codes and Drug-Free Schools compliance materials may further clarify how institutional messaging co-occurs with perceived norms and use.

In line with prior public health and education research, immigrant generation and high school location were used as pragmatic proxy measures of acculturation [50]. These indicators provide useful insight into students' cultural and educational contexts but cannot capture the multidimensional nature of acculturation, which encompasses language, identity, values, and social networks. Accordingly, we have revised the Methods to clarify this operationalization and, interpretively, these proxy limitations suggest that inferences about acculturation are tentative and would be strengthened by validated multidimensional scales. Interpreting nativity effects through this lens cautions against essentialist readings and highlights acculturative stress and campus climate as plausible mechanisms. Consistent with this view, observed nativity differences are compatible with the possibility that specific acculturation dimensions condition the protective association of private religiosity.

In the context of Muslim college students, these parallels highlight the need to interrogate how legal, social, and cultural transformations are reshaping substance-use patterns among religious minorities on U.S. campuses. This pattern is consistent with Jones et al.'s (2020) findings, where parents reported shifts in perceptions of adolescent exposure to cannabis following legalization, which suggests that legalization doesn't just change policy, it reshapes community norms and family-level perceptions. From a social work perspective, these findings also demonstrate how health disparities emerge when prevention policies and campus interventions do not adequately account for religious identity as a key social determinant of health. Viewed through an equity lens, the absence of faith-relevant language in drug-policy communication can be understood as a potential contributor to informational and care-access gaps for religious students. Likewise, the profile of results aligns with the interpretation that attending to both religious concerns and perceived peer norms may reduce misalignment between students' beliefs and their understanding of campus expectations.

We interpret the findings through Akers' Social Learning Theory (SLT), differential association, definitions, imitation, and reinforcement, supplemented by social norms (normative misperception) theory. We did not implement the full Social Structure and Social Learning (SSSL) model; policy and campus conduct

environments are treated as structural backdrops rather than directly modeled. In campus environments where cannabis use is visible, accessible, and framed as normative, particularly amid growing legalization and cultural acceptance, students may increasingly view such behaviors as acceptable, regardless of religious teachings. Peer modeling, especially when unaccompanied by visible consequences, contributes to the internalization of substances as part of college social life. The absence of culturally relevant counter-narratives may exacerbate this dynamic, as shown in prior work on college students, where the lack of protective messaging amplified the perceived normalcy of cannabis use [47]. Within this theoretical constellation, the normalization and peer-modeling evidence is congruent with interpretations that situate faith-sensitive, norm-focused strategies within the mechanisms identified here. Social norms interventions that correct misperceptions of peer use have shown preventive benefits in student populations (McAlaney et al., 2011). Consistent with our adjusted results, lower private religiosity—but not public religiosity—was associated with cannabis use, and polysubstance involvement was the strongest correlate. This pattern aligns with models in which confidential Screening, Brief Intervention, and Referral to Treatment (SBIRT) and non-moralizing norms work to address the salient pathways in this population.

Normative Perception Theory [43] provides additional insight into how students' perceptions of peer behavior can influence their substance use. This framework distinguishes between injunctive norms (perceptions of what others approve of) and descriptive norms (perceptions of what others actually do), with the latter being especially influential. Although our study did not directly measure perceived peer cannabis use, prior research consistently shows that overestimation of peer substance use is associated with greater personal use among college students [44, 47]. Within this theoretical lens, our findings on co-occurring substance use can be interpreted as reflecting how students may internalize broader campus norms, even when they conflict with religious values. From a measurement standpoint, the mediating role of descriptive norms remains an open question that would be clarified by validated instruments in future analyses. Where state legalization coexists with campus prohibitions, elevated misperception risk can be read as a function of mixed normative cues, making it informative to consider norm-feedback alongside compliance information for observant students.

The concept of "situational religiosity" [33] offers further insight into this phenomenon. Our results underscore the protective role of private religiosity, students who viewed their religious beliefs as personally important were significantly less likely to use cannabis. However, public religious practices such as mosque attendance were not significantly associated with reduced use. This pattern suggests that internalized conviction may buffer peer influence more than visible observance alone. Interpreted in this way, moral framing may exacerbate stigma-related barriers to help-seeking among students who use. Many students appear to compartmentalize their faith, maintaining religious norms in familial or religious settings while adopting more permissive behaviors in social or academic contexts. In turn, the observed clustering of substances can be read as supporting the relevance of counseling models that acknowledge faith tensions while engaging concrete co-use scenarios, including potency/adulterant risks.

Another significant finding was the higher prevalence of cannabis use among immigrant students compared to their U.S.-born peers. In this study, “youth” refers specifically to undergraduate students aged 18–24, the age range most commonly associated with elevated risk-taking and experimentation [12]. In line with prior public health and education research, immigrant generation and high school location were used as pragmatic proxy measures of acculturation [1, 50]. These indicators provide useful insight into students’ cultural and educational contexts, but they cannot capture the multidimensional nature of acculturation, including language, identity, values, and social networks. Accordingly, we have revised the Methods to clarify this operationalization and, as such, the proxy-based approach highlights measurement constraints, rendering inferences about cultural adaptation processes provisional pending validated scales. Within Berry’s (2017) framework, such patterns may reflect stress associated with navigating dual normative systems, and the associations observed here are consistent with interpretations that emphasize immigration-related stressors and outreach needs within higher-education contexts. Analytically, models that incorporate validated acculturation measures alongside policy/context indicators and test interactions with private religiosity would clarify whether the observed associations reflect moderation by exposure.

The results challenge the sufficiency of universal, abstinence-only prevention models and favor culturally responsive, theory-informed approaches. Within this interpretation, the mechanisms identified—peer norms, religiosity, and polysubstance clustering—map onto approaches that emphasize peer-led norm clarification, faith-sensitive messaging, and brief interventions for co-use. At the contextual level, the mixed state–federal environment implies that clarity around how campus rules interface with state law and medical documentation is a meaningful component of students’ interpretive landscape. In practical terms, the dynamics documented here are most coherently understood in settings that combine consistent conduct expectations with nonjudgmental health information and early-help pathways (e.g., medical amnesty paired with education).

Overall, this study extends the growing literature on substance use among Muslim American youth by demonstrating how cannabis use is embedded within broader psychosocial and sociocultural processes. It underscores the influence of peer behavior, identity negotiation, and perceived norms in shaping substance use. It further identifies private religiosity as a salient protective factor whose effect may vary by policy and campus context. Future research should incorporate longitudinal designs, campus and state policy measures, and validated perceived-norms scales. Qualitative inquiry can deepen the understanding of how students reconcile competing value systems and construct meaning around use [52]. Framed this way, extensions of the present work may clarify how social work and campus-health responses engage the intersection of cultural identity, mental health, and drug policy. Finally, tracking harms and contexts of use (e.g., co-use indicators, adverse events) alongside prevalence would allow a more nuanced interpretation of program effects over time.

Implications for Policy and Prevention

The findings have direct implications for policy, prevention, and mental health practice for culturally and religiously diverse student populations, including Muslim undergraduates. The lifetime prevalence of cannabis use (20.2%) represents a marked increase from earlier benchmarks [3] and should be interpreted amid legalization and shifting norms that may attenuate previously protective religious cues. Evidence from Washington State likewise indicates that legalization alters perceived exposure and contributes to normalization [27]. Together, these trends challenge the assumption that religiosity is uniformly protective. Sustained health education remains warranted given risks associated with heavy or long-term use [19]. In parallel, campus leaders must reconcile off-campus legalization with on-campus prohibitions under the federal Drug-Free Schools and Campuses Act (DFSCA), aligning health messaging and policy communication.

Social Learning Theory suggests that observational learning within peer networks shapes behavior as cannabis is normalized. Normative Perception Theory further explains co-use: perceived peer behavior (descriptive norms) often matters more than perceived approval. In our tri-state sample, cannabis clustered with alcohol, tobacco/hookah, and other drugs, and lower private (not public) religiosity was associated with higher odds of use, consistent with internalized belief buffering against peer modeling. The coexistence of state legalization with federal campus prohibitions likely heightens normative ambiguity, making descriptive-norm correction and faith-sensitive, peer-led interventions particularly salient for Muslim undergraduates. Emerging evidence also shows that policy change has reframed cannabis from subcultural to more mainstream meanings among youth, reinforcing the normalization pathway described here [20]. Post-legalization analyses likewise support co-designed, pragmatic education attentive to potency, dosing, and context (Jenkins et al., 2023).

Campuses should embed confidential SBIRT within student health and pair accurate norm-feedback with peer-led programming co-designed with MSAs and chaplaincy. Educational materials should deliver practical harm-reduction guidance (potency/dose, avoiding co-use, adulteration risk) while affirming abstinence for those who choose it. Social-norms interventions that correct misperceptions of peer use have demonstrated preventive utility in student populations (McAlaney et al., 2011).

Traditional abstinence-only models are insufficient for students negotiating faith and acculturation pressures. Universities should implement culturally grounded, norm-sensitive interventions that correct misperceptions of peer use, provide non-stigmatizing education, and acknowledge moral ambivalence when behavior diverges from belief. Collaborations with MSAs, chaplains, and community leaders can provide alternative models of belonging and resilience. Counseling services should be equipped for identity conflict and value dissonance, using faith-affirming language, cultural humility, and robust confidentiality. To lower barriers to early help-seeking, institutions should publicize medical-amnesty/Good-Samaritan provisions that prioritize education and linkage to care over punitive escalation for first incidents. Stigma-aware delivery is essential, as intragroup stigma can deter help-seeking and reduce reach (Adleyet al., 2023).

Universities should move beyond generic health promotion to strategies that reflect religious and cultural diversity. Reviews of housing rules, student-affairs programming, and wellness campaigns should address exclusionary signals. Public-health messaging should frame cannabis not only in legal/biomedical terms but also ethical/spiritual dimensions consistent with holistic well-being. Campus policy communication must reconcile state law with university prohibitions, specify pathways for medical-use documentation, and set clear safety expectations. For DFSCA compliance, institutions should document annual AOD notifications, consistent enforcement standards, and a biennial review that evaluates program effectiveness and equity of reach. Messaging should explicitly distinguish off-campus legality from on-campus prohibition.

Cannabis use clustered with alcohol, hookah, and club drugs. Although our 20.2% lifetime prevalence is lower than past-year estimates in the general college population, the pattern indicates relative suppression, with erosion of protection in permissive contexts. Given that the findings are descriptive, trauma-informed, and culturally competent, it is essential for counseling to establish nonjudgmental environments that address issues related to identity conflict, discrimination, and acculturative stress. Additionally, the counseling process should incorporate concrete harm-reduction strategies to effectively support individuals facing these challenges. Routine, confidential screening for common combinations and brief interventions should be integrated into student health. Clear communication about campus rules, paired with norm-corrective education, may reduce the normative ambiguity that facilitates co-use. Faith-sensitive supports that respect abstinence while offering practical guidance (e.g., avoiding high-potency products, not mixing substances, recognizing adulteration risk) align with the needs of Muslim undergraduates. Ongoing monitoring should track harms and contexts of use, not only prevalence; institutions should pre-specify indicators (e.g., alcohol co-use, ED transport, self-reported adverse events) for term-by-term review.

Student counselor services can advocate for religion-disaggregated surveillance with strong privacy protections and for funding streams that support culturally responsive, evidence-based prevention. Near-term priorities include piloting faith-sensitive norm-feedback programs, integrating polysubstance SBIRT into student-health workflows, and evaluating MSA/chaplaincy partnerships for reach, acceptability, and stigma reduction. These initiatives can strengthen equity and ensure that prevention strategies remain inclusive and sustainable across diverse campus populations.

Limitations

This study has several limitations relevant to interpretation and policy translation. The cross-sectional design precludes causal inference; period effects (post-legalization/pandemic context) may limit temporal generalizability. Outcomes were restricted to lifetime use only (no recency, frequency/quantity, mode, or potency), and we did not distinguish medical vs. non-medical use or capture harm indicators (e.g., adverse events, academic impacts), constraining prevention relevance. Self-report introduces recall and social-desirability bias; while anonymity mitigates this, misclassification remains possible. Sampling was convenience-based with tri-state overrepresentation, risking nonresponse/coverage bias and

limiting generalizability; institution-level clustering was not modeled, so standard errors may be optimistic. Policy exposure may be misclassified because we lacked verified state/campus residence and date-aligned legalization status, and we could not separate on-campus from off-campus use. Measurement constraints include brief indices of religiosity/acculturation without validated multidimensional scales; perceived norms (descriptive/injunctive) were not directly measured; and we did not assess measurement invariance by gender, nativity, or sect, which could bias subgroup contrasts. Unmeasured confounders (e.g., mental health, socioeconomic strain, residence/Greek status) may remain. The modest sample size limited power for interactions (e.g., religiosity × policy context) and sensitivity checks; mediation/structural tests of Social Learning and Normative Perception theories were not conducted. Future work should use longitudinal or mixed-methods designs, verify residence and policy timing, differentiate on- vs. off-campus and medical vs. non-medical use, include harm outcomes, apply multilevel models and validated religiosity/acculturation/norms scales with invariance testing, and pre-plan power for interactions and mediation

Conclusion

Cannabis use among Muslim American undergraduates is shaped by normative and institutional contexts: private religiosity, but not public practice, was protective, and polysubstance involvement concentrated risk. Interpreted alongside state legalization and federal Drug-Free Schools and Campuses Act prohibitions, the findings indicate that protection from religious identity may erode in permissive environments that normalize access and co-use. For prevention and policy, universities should pair clear, consistent communication about campus rules with a health-led, harm-reduction strategy: confidential SBIRT embedded in student health, norm-correction (descriptive and injunctive), and faith-sensitive, co-designed education that provides practical guidance (potency/dose, avoiding co-use, adulteration risk) while affirming abstinence for those who choose it. Equity actions, medical amnesty pathways, partnerships with MSAs/chaplaincy, and routine monitoring of harms and contexts (not only prevalence) can improve reach and accountability. Future work should use longitudinal designs, validated perceived norms and acculturation measures, and link to campus/state policy indicators to test mechanisms and inform scalable, culturally responsive campus responses.

Declarations

Ethical Approval and Consent to Participate

The study was conducted in accordance with the Declaration of Helsinki. Ethical approval was obtained from the Adelphi University Institutional Review Board (AU-IRB-051119). All participants provided electronic informed consent, and no identifying information was collected. Data were stored securely on password-protected servers accessible only to the research team.

Authorship

The author meets ICMJE authorship criteria, having contributed substantially to the study design, data collection, analysis, interpretation, and manuscript preparation.

Declaration of Interests

The author declares no competing financial or personal interests.

Funding

No specific funding was received for this research.

Data Availability Statement

The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

Generative AI Use

Generative AI was used only for language refinement and formatting under the author's direct supervision; all intellectual content is the author's own.

Inclusive Language

The manuscript uses culturally sensitive, bias-free language, particularly when discussing Muslim student populations.

Sex- and Gender-Based Analysis

Sex and gender were self-reported and analyzed, though not the study's focus; findings are presented inclusively, noting the need for research on non-binary and gender-diverse Muslim students.

Jurisdictional Claims

Findings reflect Muslim undergraduate students in U.S.-based universities and may not generalize to other contexts.

Biographical Note

Wahiba Abu-Ras, PhD, is a Professor of Social Work at Adelphi University and a recognized expert in the fields of mental health, substance use, and health equity among Muslim and immigrant communities in the United States. Her research focuses on the intersections of religiosity, acculturation, and behavioral health, with an emphasis on culturally responsive care and community-based interventions. Dr. Abu-Ras has published widely on the experiences of Muslim Americans, particularly in the context of post-9/11 discrimination, stigma, and access to mental health services.

Ligia Akthar, a second-year MSW student and research assistant at Adelphi University School of Social Work. Her research interest focuses on women's mental health, disability inclusion spiritually, and religiosity among immigrant and minority populations, with a commitment to advancing equity and culturally responsive social work practice.

References

1. Abraído-Lanza, A. F., Armbrister, A. N., Flórez, K. R., & Aguirre, A. N. (2006). Toward a theory-driven model of acculturation in public health research. American Journal of Public Health, 96(8), 1342–1346. doi.org/10.2105/AJPH.2005.064980
2. Abdulrahman, M. M. (2024). Uses and Implications of Marijuana from the Perspective of Islamic Law. , 42(2),*Journal of College of Sharia & Islamic Studies*http://dx.doi.org/10.29117/jcsis.2024.0390
3. Abu-Ras, W., Ahmed, S., & Arfken, C. L. (2010). Alcohol use among U.S. Muslim college students: Risk and protective factors. Journal of Ethnicity in Substance Abuse, 9(3), 206–220.doi.org/10.1080/15332640.2010.500580
4. Adley, M., Atkinson, A. M., & Sumnall, H. R. (2022). Including the multiply excluded: a mixed methods study exploring intragroup stigma towards people who use synthetic cannabinoid receptor agonists. Drugs: Education, Prevention and Policy, 30(3), 312–324. doi:10.1080/09687637.2022.2025766
5. Ahmed, S., Abu-Ras, W., & Arfken, C. L. (2014). Prevalence of risk behaviors among U.S. Muslim college students. Journal of Muslim Mental Health, 8(1), 63–86.doi.org/10.3998/jmmh.10381607.0008.101
6. Ahmed, N. H. S., Jafarzadeh, S., & Alipour, S. (2025). Examination of the Ruling on Narcotics in Islamic Jurisprudence and Statutory Laws. Pakistan Journal of Life and Social Sciences. 23(1):434-447 doi:10.57239/PJLSS-2025-23.1.0034
7. Akers, R. L. (1998). Social learning and social structure: A general theory of crime and deviance. Northeastern University Press. archive.org/details/sociallearningso0000aker_v9y8
8. Ali-Faisal, S. F. (2019). Religiosity, coping, and mental health in Muslim college students. Journal of Muslim Mental Health, 13(1), 3–23.doi.org/10.3998/jmmh.10381607.0013.102
9. American College Health Association. (2024). National College Health Assessment III: Reference group executive summary Spring 2024. Silver Spring, MD: American College Health Association.www.acha.org/NCHA
10. Ammerman, N. T. (2014). Finding religion in everyday life. Sociology of Religion, 75(2), 189-207.doi.org/10.1093/socrel/sru013
11. Anderson, R. (2025). Higher Education Policy in 2025: Toward a New State–Federal Policy Relationship?. Change: The Magazine of Higher Learning, 57(2), 11–15.
12. Arnett, J. J. (2018). Conceptual foundations of emerging adulthood. In Emerging adulthood and higher education (pp. 11–24). Routledge. doi:10.4324/9781315457039
13. Arfken, C. L., Ahmed, S., & Abu-Ras, W. (2013). Respondent-driven sampling of Muslim undergraduate U.S. college students and alcohol use: Pilot study. Social Psychiatry and Psychiatric Epidemiology, 48, 945–953.http://dx.doi.org/10.1007/s00127-012-0588-4
14. Baldwin, G. T., Vivolo-Kantor, A. M., Hoots, B., Roehler, D. R., & Ko, J. Y. (2024). Current cannabis use in the United States: Implications for public health research. American Journal of Public Health, 114(S8), S624–S627. doi.org/10.2105/AJPH.2024.307823
15. Bandura, A. (1977). Social learning theory. Prentice-Hall.

16. Barker, A. K., & Moreno, M. A. (2020). Effects of recreational marijuana legalization on college students: A longitudinal study of attitudes, intentions, and use behaviors. Journal of Adolescent Health, 68(1), 110–115. doi:10.1016/j.jadohealth.2020.03.039
17. Berry, J. W. (2017). Theories and models of acculturation. The Oxford handbook of acculturation and health, 10, 15-28.
18. Bilgrei, O. R., Scheffels, J., Buvik, K., & Tokle, R. (2022). The green shift? Narratives of changing cannabis policies and identity-work among Norwegian adolescents. Drugs: Education, Prevention and Policy, 29(4), 355–363. doi:10.1080/09687637.2021.2023468
19. Coggans, N., Dalgarno, P., Johnson, L., & Shewan, D. (2004). Long-term heavy cannabis use: implications for health education. Drugs: Education, Prevention and Policy, 11(4), 299–313. doi:10.1080/09687630410001687860
20. Dahl, S. L., Bretteville-Jensen, A. L., & Burdzovic Andreas, J. (2024). From subcultural to mainstream? The evolving meaning of cannabis use among youth in a restrictive policy context. Drugs: Education, Prevention and Policy, 32(1), 63–71. doi:10.1080/09687637.2023.2299368
21. Ebling, T., Azagba, S., Hall, M., and King Jensen, J. 2024. American Journal of Public Health 115, 178_190.US State Recreational and Medical Cannabis Delivery Laws, 2024doi.org/10.2105/AJPH.2024.307874
22. Fiqh Council of North America. (2021, October 6). On the use of marijuana [Fatwā].fiqhcouncil.org/on-the-use-of-marijuana/
23. Hashem, H., Dossani, H., Ghani, M., Ahsen, A. S., & Morshed, C. (2024). Belonging as a predictor of substance use for Muslim American emerging adults. Journal of Muslim Mental Health, 17(2). doi:doi.org/10.3998/jmmh.1176
24. Hijaz, D. (2024). Substance use patterns among Muslim American young adults: A mixed methods design assessing risk and protective factors (Master's thesis, University of New Mexico). University of New Mexico Digital Repository. digitalrepository.unm.edu/psy_etds/473/
25. Jenkins, E., Dearden, T., Figueras, A., McGuinness, L., Ewert, A., & Haines-Saah, R. (2021). Cannabis education resources for parents: an environmental scan and critical content analysis in the context of legalization. Drugs: Education, Prevention and Policy, 30(2), 124–140. doi:10.1080/09687637.2021.2002815
26. Johnston, L. D., Miech, R. A., Patrick, M. E., O'Malley, P. M., Schulenberg, J. E., & Bachman, J. G. (2023). Monitoring the Future National Survey Results on Drug Use, 1975-2022: Overview, Key Findings on Adolescent Drug Use. Institute for Social Research.
27. Jones, T. M., Eisenberg, N., Kosterman, R., Lee, J. O., Bailey, J. A., & Haggerty, K. P. (2020). Parents' perceptions of adolescent exposure to marijuana following legalization in Washington state. Journal of the Society for Social Work and Research, 11(1), 21-38.doi.org/10.1086/707642
28. Karami, S., Morovat, S., Akbarnezhaad, M., & Sepidnameh, B. (2022). Analyzing the concept and factors of situational religiosity in the Holy Qur'an. Ketab-E-Qayyem, 12(27), 89-109.10.30512/kq.2021.17108.3174

29. Koenig, H. G., & Büssing, A. (2010). The Duke University Religion Index (DUREL): A five-item measure for use in epidemiological studies. Religions, 1(1), 78–85. doi.org/10.3390/rel1010078
30. Leung, J., Chan, G., Stjepanović, D., Chung, J. Y. C., Hall, W., & Hammond, D. (2022). Prevalence and self-reported reasons of cannabis use for medical purposes in USA and Canada. Psychopharmacology, 239(5), 1509-1519.doi.org/10.1007/s00213-021-06047-8
31. McAlaney, J., Bewick, B., & Hughes, C. (2010). The international development of the 'Social Norms' approach to drug education and prevention. Drugs: Education, Prevention and Policy, 18(2), 81–89. doi:10.3109/09687631003610977
32. McAuslan, P., Altairi, S., & Siefert, C. (2020). The relationship between religion, gender, and substance use in Muslim Arab American emerging adults. Journal of Muslim Mental Health, 14(2), 63–86. doi.org/10.3998/jmmh.10381607.0014.203
33. Mechammil, M., & Cruz, R. (2021). Greater loss of face and family honor values are associated with greater positive expectancies and substance abuse among Middle Eastern/Northern African U.S. college students. The American Journal of Drug and Alcohol Abuse, 48(1), 38–48.doi.org/10.1080/00952990.2021.1954937
34. Michalak, L., Trocki, K., & Bond, J. (2006). Religion and alcohol in the U.S. national alcohol survey: How important is religion for abstention and drinking? Journal of Studies on Alcohol, 68(3), 434–442.doi.org/10.15288/jsad.2007.68.434
35. Miech, R., Leventhal, A., Patrick, M., & Rodriguez, N. (2025). Trends in use of cigarettes and e-cigarettes among young adults who had smoked in adolescence: 2017–2022. Tobacco Control.doi.org/10.1136/tc-2024-059018
36. Miller, A. M., Rosenman, R., & Cowan, B. W. (2017). Recreational marijuana legalization and college student use: Early evidence. SSM - Population Health, 3, 649–657.doi.org/10.1016/j.ssmph.2017.08.001
37. Moffat, B. M., Haines-Saah, R. J., & Johnson, J. L. (2016). From didactic to dialogue: Assessing the use of an innovative classroom resource to support decision-making about cannabis use. Drugs: Education, Prevention and Policy, 24(1), 85–95. doi:10.1080/09687637.2016.1206846
38. Mohamud, M. (2024). Prevalence of Drug Abuse among Muslim Students in Public Secondary Schools in Mombasa County, Kenya (Doctoral dissertation, Kenyatta University).
39. Napper, L. E., Hummer, J. F., Chithambo, T. P., et al. (2015). Perceived parent and peer marijuana norms: The moderating effect of parental monitoring during college. Prevention Science, 16(3), 364–373. doi.org/10.1007/s11121-014-0493-z
40. Padela, A. I., & Heisler, M. (2010). The association of perceived abuse and discrimination after September 11, 2001, with psychological distress, level of happiness, and health status among Arab Americans. American Journal of Public Health, 100(2), 284–291. doi.org/10.2105/AJPH.2009.164954
41. Patel, S. (2024). The Relationship Between Religious Values and Substance Usage in Muslim Communities. SSRN.http://dx.doi.org/10.2139/ssrn.5009404

42. Pennay, A. E., & Measham, F. C. (2016). The normalisation thesis – 20 years later. Drugs: Education, Prevention and Policy, 23(3), 187–189. doi:10.3109/09687637.2016.1173649
43. Perkins, H. W., & Berkowitz, A. D. (1986). Perceiving the community norms of alcohol use among students: Some research implications for campus alcohol education programming. International Journal of the Addictions, 21(9-10), 961–976.
44. Perkins, H. W. (2014). Misperception is reality: The “reign of error” about peer risk behaviour norms among youth and young adults. In M. Xenitidou & B. Edmonds (Eds.), The complexity of social norms (pp. 11–36). Springer International Publishing. doi:10.1007/978-3-319-05308-0_2
45. Pew Research Center. (2025, June 18). How U.S. Muslims compare with other Americans religiously and demographically. www.pewresearch.org/short-reads/2025/06/18/how-us-muslims-compare-with-other-americans-religiously-and-demographically/
46. Qatanani, A., Umar, M., & Padela, A. I. (2021). Bioethical insights from the Fiqh Council of North America’s recent ruling on medical cannabis: A jurisprudential review. International Journal of Drug Policy. 97,103360. .doi.org/10.1016/j.drugpo.2021.10336o
47. Rothstein, M. C., & Stamates, A. L. (2025). Co-use of alcohol and cannabis: Do social norms relate to personal use and consequences among college students? Journal of American College Health, 1–9. doi:10.1080/07448481.2025.2501008
48. Substance Abuse and Mental Health Services Administration. (2022, November 17). TI-21-008: Screening, brief intervention, and referral to treatment (SBIRT) grant announcement. www.samhsa.gov/grants/grant-announcements/ti-21-008
49. Schulenberg, J. E., Patrick, M. E., Johnston, L. D., O’Malley, P. M., Bachman, J. G., & Miech, R. A. (2021). Monitoring the Future national survey results on drug use, 1975–2020 (Vol. II): College students & adults ages 19–60. Ann Arbor: Institute for Social Research, University of Michigan. http://monitoringthefuture.org/pubs.html#monographs
50. Schwartz, S. J., Unger, J. B., Zamboanga, B. L., & Szapocznik, J. (2010). Rethinking the concept of acculturation: Implications for theory and research. American Psychologist, 65(4), 237–251.doi.org/10.1037/a0019330
51. Shipley, J. L., & Braitman, A. L. (2024). Assessment of simultaneous alcohol and cannabis use and its related consequences and cognitions in college students: A narrative review. Alcohol: Clinical and Experimental Research, 48(2), 230-240.doi.org/10.1111/acer.15258
52. Unger, J. B., Schwartz, S. J., Huh, J., Soto, D. W., & Baezconde-Garbanati, L. (2014). Acculturation and perceived discrimination: Predictors of substance use trajectories from adolescence to emerging adulthood among Hispanics. Addictive Behaviors, 39(9), 1293–1296.doi.org/10.1016/j.addbeh.2014.04.014
53. U.S. Department of Education. (n.d.). Complying with the Drug-Free Schools and Campuses Regulations (EDGAR Part 86): A guide for university and college administrators.
54. U.S. Religion Census. (2020, November 11). U.S. Religion Census shows both stability and change in congregational life [Press release]. www.usreligioncensus.org/node/1641

55. von Elm, E., Altman, D. G., Egger, M., Pocock, S. J., Gøtzsche, P. C., Vandenbroucke, J. P., & STROBE Initiative. (2007). Strengthening the reporting of observational studies in epidemiology (STROBE) statement: Guidelines for reporting observational studies. BMJ, 335(7624), 806–808. doi.org/10.1136/bmj.39335.541782.AD
56. Volkow, N. D., Han, B., Einstein, E. B., & Compton, W. M. (2021). Prevalence of substance use disorders by time since first substance use among young people in the U.S. JAMA Pediatrics, 175(6), 640–643. doi:10.1001/jamapediatrics.2020.6981
57. Wechsler, H., Lee, J. E., Kuo, M., Seibring, M., Nelson, T. F., & Lee, H. (2002). Trends in college binge drinking during a period of increased prevention efforts: Findings from 4 Harvard School of Public Health College Alcohol Study surveys: 1993–2001. Journal of American college health, 50(5), 203-217.
58. Williams, L., Ralphs, R., & Gray, P. (2017). The normalization of cannabis use among Bangladeshi and Pakistani youth: A new frontier for the normalization thesis?. Substance use & misuse, 52(4), 413-421.doi.org/10.1080/10826084.2016.1233565
59. Yang, E. S., Oh, S., Kim, S., & Chung, I. (2022). The influence of parent and peer disapproval on youth marijuana use mediated by youth risk perception: Focusing on the state comparison. Drug and Alcohol Dependence, 240, 109641. doi.org/10.1016/j.drugalcdep.2022.109641

Tables

Tables 1 to 4 are available in the supplementary files section