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The Divergent Associations of LGBTQ+ Belongingness with Illicit Drug Use and Alcohol Consumption Among Adults in Kentucky

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Abstract

LGBTQ+ individuals face substance use disparities linked to minority stress. While community belongingness may buffer stress, its role is complex. This study examined divergent associations between belongingness within the LGBTQ+ community and lifetime illicit drug use versus past-year alcohol frequency among LGBTQ+ adults in Kentucky (n = 2953), a region with notably high rates of substance use. Methods: Cross-sectional online survey data were analyzed. We measured LGBTQ+ belongingness, lifetime use of cocaine/crack/heroin/methamphetamine, and past-year alcohol frequency. Logistic and linear regressions controlled for age, education, gender identity, and income. Results: Greater belongingness predicted significantly higher odds of lifetime illicit drug use (OR = 1.24) but lower past-year alcohol consumption frequency (B = −0.094). Transgender and gender expansive identity predicted significantly higher illicit drug use odds and higher alcohol frequency. Conclusions: In this Kentucky sample, LGBTQ+ belongingness showed divergent substance use associations: it was protective against frequent alcohol use but, unexpectedly, was associated with higher odds of lifetime illicit drug use. Findings highlight belongingness's complex, context-dependent nature and the need for nuanced research and interventions considering substance type and specific vulnerabilities, particularly for TGE individuals.

Keywords: LGBTQ+ belongingness; substance use; minority stress; Kentucky; community connection; social support

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1. Introduction

The need for belonging—stable, positive interpersonal connections and group acceptance—is fundamental to human well-being [1]. For lesbian, gay, bisexual, transgender, queer, and other sexual and gender minority (LGBTQ+) individuals, this need is often amplified by experiences of societal stigma, discrimination, and prejudice [2]. For these individuals, attaining a sense of belongingness within the LGBTQ+ community can be a vital source of social support, identity affirmation, and resilience, potentially buffering the negative health impacts of minority stress [3,4]. However, LGBTQ+ populations also

experience significant disparities in rates of substance use compared to their heterosexual and cisgender peers [5,6], often linked to using substances to cope with minority stress [7,8]. However, it remains unclear how these protective effects might vary by substance type (e.g., alcohol vs. illicit drugs) or within a high-risk regional context, representing a critical gap in the literature.

The role of LGBTQ+ belongingness in relation to substance use is not straightforward. While potentially protective, community connection can sometimes be associated with substance-using norms [9,10], suggesting its impact may differ depending on the substance type and specific context. This complexity remains underexplored, particularly in regions of the US with significant substance use challenges and limited access to LGBTQ+-affirming care [11,12]. Kentucky represents such a context, grappling with high rates of substance use, particularly opioids and stimulants, pronounced rural health disparities (e.g., access to care), and barriers to a robust treatment infrastructure (including availability of services, specialized programs, and trained providers) [13–15], creating a challenging environment for its LGBTQ+ residents. Notably, while national substance use trends are well-documented, research focusing on the unique intersection of LGBTQ+ identity and substance use within this type of Appalachian or Southern state context remains scarce, with most studies centering on urban populations.

Given these intersecting issues, this study examined the potentially divergent associations between psychological belongingness (within the LGBTQ+ community) and substance use among LGBTQ+ adults in Kentucky. Using data from a large community survey and the validated LGBTQ Belongingness Attainment Scale (LGBTQ BAS [16]), we addressed two questions: (1) What is the association between LGBTQ+ belongingness and lifetime use of specific illicit drugs (cocaine, crack cocaine, heroin, or methamphetamine)? (2) What is the association between LGBTQ+ belongingness and past-year frequency of alcohol consumption? We hypothesized that greater belongingness would be associated with lower odds of lifetime illicit drug use and, separately, with lower past-year alcohol consumption frequency, after controlling for key demographic factors. This research aims to provide nuanced insights into the role of community connection within this specific high-risk population and environment.

1.1. LGBTQ+ Substance Use Disparities and the Kentucky Context

Substance use disparities affecting LGBTQ+ populations are a well-documented public health concern globally. Compared to heterosexual and cisgender individuals, LGBTQ+ people report higher rates of alcohol misuse, tobacco use, and marijuana use [5,6,8,17–20]. These disparities encompass a higher prevalence of illicit opioid use among LGB adults [21] and elevated rates of tobacco and other non-alcohol/tobacco substance use among transgender individuals [5,17]. LGBTQ+ individuals also experience higher prevalence and severity of diagnosed substance use disorders (SUDs) [5,22] and experienced increased risks of negative consequences associated with substance use (e.g., worsening mental health or higher consumption levels) during the COVID-19 pandemic [23–25]. Disparities often emerge in adolescence with earlier initiation and higher rates across substances [26].

Kentucky provides a particularly stark backdrop for these issues. The Kentucky Commonwealth, especially its Appalachian region, has been disproportionately impacted by the opioid crisis [13,27]. High rates of historical prescription opioid misuse transitioned into widespread heroin and illicit fentanyl use, contributing to overdose mortality rates often exceeding national averages [28–30]. Recent surveillance reveals alarming increases in overdose deaths among Black Kentuckians, frequently involving fentanyl and psychostimulants, alongside persistently high rates in White populations [15]. Methamphetamine use is also highly prevalent, particularly in rural areas [31–33].

Specific geographic variations exist within the commonwealth. Kentucky's Appalachian counties exhibit higher rates of SUD diagnoses compared to non-Appalachian areas [13], reflecting historical over-prescription and subsequent transitions to illicit substances [27,28,30]. Rurality itself compounds these challenges, influencing substance use patterns like age of initiation [31], higher rates of opioid-involved driving offenses [34], and creating unique overdose-risk environments characterized by isolation and stigma [27,35]. These substance use patterns are deeply intertwined with structural factors including poverty, unemployment (potentially linked to opiate exposure [36]), limited economic opportunity, and pervasive stigma [27,35]. Furthermore, while alcohol use disorder prevalence among Medicaid recipients has risen, treatment utilization remains low, especially in these rural regions [37–39].

1.2. Minority Stress and Multilevel Oppression as Explanatory Frameworks

Minority stress theory is the primary framework for understanding the elevated rates of substance use among LGBTQ+ populations [7,8,40]. This theory posits that members of minority populations, including LGBTQ+ individuals, experience excess stress stemming from societal prejudice and stigma, which operates across multiple ecological levels [2,7,41]. Structural stressors include discriminatory laws and policies [42,43], healthcare barriers such as provider-perpetuated stigma, experiences of discriminatory treatment [44,45], and economic instability driven by workplace discrimination [46]. Interpersonal stressors involve direct experiences of prejudice, violence, harassment, verbal abuse, everyday discrimination, and microaggressions [40,47–50]. Intrapersonal stressors encompass the internalization of societal stigma (internalized heterosexism/cisgenderism), expectations of rejection, and difficulties with identity concealment or disclosure [7,8,41,51–53].

Chronic exposure to these multi-level stressors contributes significantly to adverse mental health outcomes, including higher rates of depression, anxiety, posttraumatic stress disorder, and psychological distress [45,54–56]. Substance use often emerges as a maladaptive coping mechanism employed to manage the psychological pain and emotional dysregulation resulting from these stressors [26,52,54,55,57]. Research indicates that stressors like daily microaggressions are linked to concurrent substance use problems [58], and specific motives, such as using substances to cope with negative affect, mediate the pathway between minority stress and substance misuse [52,55]. Lack of belonging, or thwarted belongingness, itself represents a significant stressor associated with poor mental health, including increased suicide risk, and may also contribute to substance use [57,59–61]. Early life adversity, such as childhood maltreatment, can further increase vulnerability [62,63], compounding the impact of minority stress across the lifespan [8].

1.3. Intersectionality: Heterogeneity Within LGBTQ+ Populations

The experiences of minority stress and associated substance use risks are not uniform across the diverse LGBTQ+ population; they are profoundly shaped by intersecting identities related to race, ethnicity, gender identity, sexual orientation, age, socioeconomic status, disability, and other social positions [7,8,20,64,65]. An intersectional, multilevel oppression framework helps elucidate how these identities interact to create unique and often compounded forms of stress and marginalization [7,41]. For instance, bisexual individuals, particularly women, frequently report higher rates of substance use and related mental health problems compared to monosexual (gay/lesbian) individuals, potentially linked to experiences of biphobia, erasure from both heterosexual and LGBTQ+ communities, and sometimes higher rates of familial substance misuse history [18,19,22,66–68]. Individuals unsure of their sexual identity also face uniquely elevated risks for severe SUDs [22].

Transgender and gender expansive (TGE) individuals encounter specific stressors (e.g., cissexism, transphobia, barriers to gender-affirming care, misgendering, and violence) that elevate their risk for SUDs, particularly nicotine and non-alcohol SUDs [5,17,66], a risk potentially higher among transfeminine individuals [5]. Research examining other specific identities such as queer, pansexual, or genderqueer also reveals distinct patterns of substance use [69]. LGBTQ+ people of color face compounded stressors stemming from simultaneous exposure to racism and LGBTQ-related discrimination. They may experience exclusion or marginalization within predominantly White LGBTQ+ spaces while also facing potential lack of acceptance within their ethnoracial communities [51,70–75]. Intersectional analyses show complex patterns, sometimes amplifying disparities for racial/ethnic minority LGB women compared to White LGB women, while patterns among men may vary, occasionally indicating resilience factors among men of color [50,64,65]. Furthermore, factors like age cohorts [19,76], socioeconomic status, disability, religious identity conflict, housing instability, criminal justice involvement, and rural versus urban residence further modify experiences of stress, risk, resilience, and access to resources [8,46,59,77–81]. A comprehensive understanding of substance use within LGBTQ+ populations requires acknowledging this extensive heterogeneity.

1.4. The Role and Complexity of LGBTQ+ Community Belongingness

Amidst these stressors, connection to the LGBTQ+ community is a potentially crucial psychosocial factor and social determinant of health [2,82]. Psychological belongingness—defined as a subjective sense of being connected, affiliated, and experiencing companionship within a group [16,83], especially as it relates to LGBTQ+ individuals and the larger LGBTQ+ community, can offer significant benefits. It may buffer against the detrimental effects of minority stress [4,61,84], reduce internalized stigma [85], enhance psychological resilience [3,71,86–88], foster identity affirmation and pride [87,89,90], and potentially decrease reliance on maladaptive coping strategies like substance use [62,63,91–93]. Supportive community resources and identity-affirming connections developed in recovery are also linked to positive outcomes [94–96].

However, the relationship between LGBTQ+ community connection and substance use is multifaceted and context-dependent, requiring careful consideration. Firstly, it is methodologically and conceptually crucial to distinguish subjective psychological belonging from mere behavioral involvement in community activities or spaces [9,26,97]. While psychological belonging may be protective, participation in certain community settings, particularly bars or other nightlife venues, where substance use, especially alcohol, is prevalent or normalized, may increase risk [8,9,18,54,98,99]. Indeed, some research suggests community engagement might not always buffer against victimization's effects on substance use and could even amplify this link if it connects individuals to spaces where substance use is a common coping strategy [10,54]. Belonging to specific subcultures, such as drug-using or sexualized drug use scenes, inherently links community connection with high-risk substance use [100,101].

Secondly, the quality and inclusivity of belonging are paramount [102,103]. LGBTQ+ communities are not monolithic and can harbor internal hierarchies, prejudice, and exclusion based on race, ethnicity, gender identity (transphobia), bisexuality (biphobia), class, disability, or other factors [70,72,73,78,104–107]. Experiences of such intra-community discrimination can undermine any potential benefits of belonging and exacerbate risk, particularly for multiply marginalized individuals who may need to seek out specific intersectional spaces to find genuine acceptance [70,72,75]. Navigating mainstream recovery groups like Alcoholics Anonymous can also present unique challenges related to integrating LGBTQ+ identity and recovery [108].

Finally, the impact of belongingness likely differs based on the specific substance, individual characteristics, and the broader social and structural environment [81,102,103]. Belongingness might function differently in affirming versus hostile policy climates or when conflicting with other identities, such as a non-affirming religious identity [80,81]. Therefore, while potentially buffering against stressors, community belongingness is not uniformly protective against substance use. Its effects may diverge, potentially reducing risk for certain behaviors (perhaps those linked to severe isolation or distress) while being associated with or even increasing the risk for others (perhaps those embedded in social participation norms).

1.5. Gaps in Formal Substance Use Services and the Kentucky Treatment Landscape

Persistent deficiencies in formal substance use treatment systems underscore the importance of informal support like LGBTQ+ community belongingness. Nationally, there is a well-documented scarcity of services that are accessible, affordable, culturally competent, and affirming for LGBTQ+ individuals [109–112]. While availability has increased slightly, specialized programs remain uncommon (~20% of facilities in 2018) and exhibit [11,12]. Qualitative research consistently reveals LGBTQ+ individuals' negative experiences within mainstream treatment settings, including stigma from treatment providers or peers related to their sexual orientation or gender identity [44,113]. Such experiences often lead to concealment, treatment dropout, or relapse. Specific barriers impede access to medications for opioid use disorder (MOUD), with few facilities offering both MOUD and genuinely LGBTQ+-specific services [112]. Furthermore, healthcare providers often lack adequate training on LGBTQ+ health needs related to substance use [114], contributing to diagnostic and engagement disparities [66]. Compounding these issues, systematic data collection on substance use outcomes like overdose among LGBTQ+ populations is often lacking [115].

In Kentucky, these national issues intersect with substantial state-level challenges in the general SUD treatment landscape, particularly in rural and Appalachian areas. Significant barriers impede access to MOUD due to organizational constraints, provider shortages, stigma surrounding both opioid use disorder and its medication-based treatments, complex opioid substitution (e.g., buprenorphine) initiation protocols, and a lack of reliable referral pathways [116]. Physician capacity is limited by factors including inadequate training, negative attitudes towards SUD treatment, and lack of institutional support [117]. While insurance coverage expanded under the Affordable Care Act for many [118], accessing actual treatment, especially in rural areas, remains difficult [37–39]. This challenging treatment environment, combined with the commonwealth's sociopolitical context and high rates of substance misuse, underscores the crucial need to understand how informal support systems, like LGBTQ+ community belongingness, function for LGBTQ+ Kentuckians. Given the potential for belongingness to have divergent effects on different substance use behaviors, examining illicit drug use and alcohol consumption separately within this context is crucial for developing effective, culturally informed strategies.

2. Materials and Methods

2.1. Study Design and Participants

Data for this study (N = 3370) were derived from the Queer Kentucky Survey, a cross-sectional online survey conducted 13 April through 15 July 2024. The survey instrument was developed, and data were collected using the Qualtrics XM Platform. Recruitment targeted LGBTQ+ individuals living in Kentucky during the data collection period who were at least 18 years of age, utilizing non-probability convenience and snowball sampling. Participants were recruited via outreach at LGBTQ+ community events (e.g., Pride festivals, LGBTQ+ health fairs) and through online channels, including social media platforms

frequented by LGBTQ+ individuals and listservs of partner organizations, and participants were also encouraged to share the survey link within their social networks. The survey collected data across multiple domains, including demographic information, health status and behaviors (e.g., mental health, substance use, health conditions, and sexual and protective behaviors), psychosocial factors (e.g., belongingness and perceived discrimination), and feelings toward anti-LGBTQ+ legislation.

Because of the non-probability convenience and snowball sampling strategy, a formal response rate could not be calculated. The final analytic sample (n = 2953) was determined after applying eligibility criteria. Inclusion in the analytic sample required participants to be currently living in Kentucky and at least 18 years of age. Furthermore, to ensure the analyses focused specifically on individuals identifying within the LGBTQ+ spectrum based on sexual orientation or gender identity, participants who selected "Heterosexual/straight" or "Prefer not to answer" for sexual orientation and did not identify as TGE were excluded from the sample used for regression modeling. Participants identifying as transgender or gender expansive were retained regardless of reported sexual orientation. Participants provided electronic informed consent before beginning the survey, and identifying information was removed before analysis. Participation was incentivized by a random drawing for 25 USD 100 gift cards. The study protocol received Institutional Review Board approval. The achieved sample was predominantly White (90.9%), identified largely as cisgender men (65.9%), and reported high levels of educational attainment. The sample also skewed towards young and early mid-adulthood. Full demographic characteristics for the analytic sample are presented in Table 1. This composition, while providing valuable data, impacts the generalizability of the findings to the broader, more diverse LGBTQ+ population in Kentucky.

Table 1. Sample demographics (n = 2953).

Characteristic	*n*	%
Gender identity (N = 3196)		
Cisgender man	2107	65.9
Cisgender woman	621	19.4
Transgender man	120	3.8
Transgender woman	84	2.6
Nonbinary	82	2.6
Genderqueer or gender-fluid	88	2.8
Gender non-conforming	18	0.6
Two-spirit	12	0.4
Questioning or unsure	16	0.5
Prefer not to say	30	0.9
Identity not listed	18	0.6
Sexual orientation (N = 3204)		
Gay	1856	57.9
Lesbian	208	6.5
Bisexual	281	8.8
Pansexual	145	4.5
Queer	331	10.3
Heterosexual/straight	295	9.2
Questioning or unsure	8	0.2
Asexual	24	0.7
Autosexual	11	0.3
Demisexual	12	0.4
Other	14	0.4
Identity not listed	19	0.6

Table 1. *Cont.*

Characteristic	*n*	%
Race/Ethnicity (*N* = 3196)		
White or Caucasian	2906	90.9
Black or African American	174	5.4
American Indian/Native American or Alaska Native	8	0.3
Asian	8	0.3
Native Hawaiian or Other Pacific Islander	6	0.2
Identity not listed	9	0.3
Household income (*N* = 3211)		
<USD 25,000	149	4.6
USD 25,000–USD 49,999	321	10.0
USD 50,000–USD 74,999	463	14.4
USD 75,000–USD 99,999	1148	35.8
USD 100,000–USD 149,999	989	30.8
≥USD 150,000	113	3.5
Prefer not to say	28	0.9
Education (*N* = 3215)		
Some high school or less	37	1.2
High school diploma or GED	132	4.1
Some college, no degree	393	12.2
Associate or technical degree	261	8.1
Bachelor's degree	2211	68.8
Graduate or professional degree	175	5.4
Prefer not to say	6	0.2
Age (*N* = 3172)		
18–21	173	5.5
22–25	491	15.5
26–30	500	15.8
31–35	1005	31.7
36–40	912	28.8
41–50	62	2.0
51–60	22	0.7
61–64	3	0.1
≥65	4	0.1

Note. *n* = 2953 reflects the final analytic sample used in regression analyses after applying inclusion criteria and handling missing data via multiple imputation. Descriptive statistics in this table are based on the number of valid responses received for each specific item before imputation, as indicated by the *N* in parentheses for each variable.

2.2. Measures

2.2.1. LGBTQ+ Community Belongingness

Participant belongingness within LGBTQ+ spaces and relationships was measured using the 18-item LGBTQ Belongingness Attainment Scale (BAS [16]). Consistent with literature distinguishing psychological connection from behavioral participation (e.g., [97,102]), the BAS was selected for its focus on assessing multiple facets of this internal sense of belongingness: connectedness, affiliation, and companionship. Participants responded to items (e.g., "You feel a sense of connectedness to the LGBTQ+ community," "You feel the problems and challenges of the LGBTQ+ community have an impact on you," and "It is important for you to participate in LGBTQ+ community events and activities.") using a 6-point Likert-type scale anchored at 1 (Strongly Disagree) and 6 (Strongly Agree). Responses were averaged across the 18 items to create a total composite score, with higher scores indicating greater levels of LGBTQ+ belongingness. In the current study, the scale demonstrated good internal consistency (Cronbach's alpha = 0.89).

2.2.2. Lifetime Illicit Drug Use

Lifetime use of specific illicit drugs was assessed via a single item developed for the survey. The item asked, "Have you ever, even once, used cocaine, crack cocaine, heroin, or methamphetamine?" These substances were selected as they represent a class of highly potent and stigmatized illicit drugs with significant public health concern in Kentucky (e.g., [15,28,31,33]) and are often associated with severe health and social consequences. While they have different pharmacological profiles and patterns of use, they are frequently grouped in research to indicate engagement with 'hard' illicit drug use, distinct from substances like cannabis. For analysis purposes, responses were coded 0 = No and 1 = Yes. A lifetime measure was chosen for these specific substances to capture any history of this high-risk behavior, given that recent use prevalence for these drugs can be low in community samples, potentially limiting statistical power. This approach focuses on the association between belongingness and ever engaging in such use, acknowledging potential influences of long-term factors related to identity and community experience. Furthermore, a lifetime measure may mitigate the underreporting stigma associated with recent use of these substances.

2.2.3. Past-Year Alcohol Consumption Frequency

Frequency of alcohol consumption over the past year was assessed with a single item. Participants were asked, "How often did you have a drink containing alcohol in the past year? (included are liquor [such as whiskey or gin], beer, wine, wine coolers, and any other type of alcoholic beverage)". Responses were captured using a 5-point frequency scale: 1 = Never, 2 = Monthly or less, 3 = 2–4 times a month, 4 = 2–3 times a week, and 5 = Four or more times a week. A past-year frequency measure was selected for alcohol, as it reflects more current behavioral patterns relevant to recent psychosocial factors like belongingness, compared to lifetime use, which captures most adults. This timeframe aligns with standard alcohol epidemiology, balancing regular consumption patterns with minimized recall bias.

2.2.4. Demographic Covariates

Based on literature demonstrating intersectional influences on minority stress, belongingness, and substance use (e.g., [5,7,65,75]), the following demographic covariates were included: age, education level, gender identity, and household income. Participants reported age via nine categories (18–21 to 65+). The highest education level was assessed using six options (some high school or less to graduate/professional degree). Gender identity was assessed via the question "How would you describe your gender?" with the options: Cisgender Man, Cisgender Woman, Transgender Man, Transgender Woman, Nonbinary, Genderqueer or fluid, Gender Non-conforming, Two-spirit, Questioning or unsure, or an option for respondents to select if their identity was not listed. Total household income before taxes during the past 12 months was reported using six categories (less than USD 25,000 to USD 150,000 or more).

2.3. Data Analysis

For regression analyses, covariates were dichotomized. Age was categorized as 18–30 years (0, reference) versus 31 years or older (1). Education level was dichotomized as Associate/Technical degree or less (0, reference) versus bachelor's degree or higher (1). This categorization places individuals who have completed an associate's degree and are currently pursuing a bachelor's, or those with college credits but no degree, into the reference group. This approach was chosen to provide a broad contrast between those who have completed at least a four-year college degree and those who have not, a common demarcation in sociodemographic analyses. For gender identity, participants

identifying as Cisgender Man or Cisgender Woman formed the reference group (0), while those identifying as Transgender Man, Transgender Woman, Nonbinary, Genderqueer or fluid, Gender Non-conforming, Two-spirit, or who indicated their identity was not listed, were combined into a TGE group (1). Participants selecting "unsure" for gender identity were excluded from regression analyses due to small numbers and interpretive ambiguity in this context. Income was dichotomized as annual household earnings of USD 99,999 or less (0, reference) versus USD 100,000 or more (1). These variables were dichotomized primarily to facilitate clearer interpretation of odds ratios and regression coefficients for key demographic contrasts within the logistic and linear models used, although this approach necessarily involves loss of information.

All statistical analyses were conducted using IBM SPSS Statistics Version 29. Descriptive statistics (frequencies, percentages, means, and standard deviations) characterized the analytic sample (n = 2953) and are reported in Table 1. Bivariate analyses were conducted to examine the correlations between study variables (see Table 2) and to test for multicollinearity. The Variance Inflation Factors for all variables were $\leq$1.6, indicating no concerns for multicollinearity. Prior to primary analyses, missing data patterns were examined, ranging from 4.8% to 11.4% for variables in regression models. In total, 267 participants (9.0%) had missing data on at least one of the variables included in the regression models. Multiple Imputation by Chained Equations (MICE) with 10 imputations [119] was employed using SPSS's fully conditional specification method to minimize bias and maximize statistical power compared to listwise deletion. The imputation model included all variables planned for the regression analyses. Parameter estimates and standard errors for regression models were computed on the combined imputed datasets using Rubin's rules. An a priori power analysis using G*Power version 3.1.9.6 for Mac [120] indicated that to detect a small effect size (i.e., an odds ratio of 1.4 for logistic regression and an f2 of 0.02 for linear regression) with 95% power at α = 0.05, given 5 predictors, a sample size of approximately n = 2617 (for logistic) and n = 995 (for linear) would be required. Our analytic sample of n = 2953 therefore provided ample power to detect small to medium effect sizes for the primary associations of interest.

Table 2. Descriptive statistics and bivariate correlations.

Variable	*M* (*SD*)	α	1	2	3	4	5	6	7
1. Illicit Drug Use			–						
2. Alcohol Consumption	3.09 (1.25)		0.01	–					
3. LGBTQ+ Belongingness	3.92 (0.83)	0.89	0.18 *	–0.15 *	–				
4. Income			–0.10 *	0.15 *	–0.18 *	–			
5. Education			–0.12 *	0.24 *	–0.19 *	0.21 *	–		
6. Gender			0.25 *	–0.10 *	0.41 *	–0.10 *	–0.23 *	–	
7. Age			–0.21 *	0.33 *	–0.30 *	0.26 *	0.55 *	–0.35 *	–

n = 2953, * p < 0.01 (two-tailed).

To address the research questions, two regression analyses were conducted using the pooled imputed data: (1) a binary logistic regression model predicting lifetime illicit drug use and (2) a linear regression model predicting frequency of alcohol consumption. Each model included LGBTQ+ belongingness as the primary independent variable, controlling for dichotomized age, education level, gender identity, and household income. Prior to interpreting the final models, relevant assumptions were checked. For the binary logistic regression model, multicollinearity was assessed as previously noted. The assumption of linearity of the logit for the continuous predictor (LGBTQ+ belongingness) was examined visually by plotting the logit against quartiles of the belongingness score and was

adequately met. For the linear regression model predicting alcohol consumption frequency, assumptions of linearity, independence of errors, homoscedasticity, and normality of residuals were assessed through visual inspection of residual plots. No major violations of assumptions were detected for either model.

3. Results

3.1. Sample Characteristics

Of an initial 3370 participants who met basic age and residency criteria from the Queer Kentucky Survey, the final analytic sample for whom regression models were estimated comprised 2953 individuals after applying specific inclusion criteria related to LGBTQ+ identification and subsequent handling of missing data via multiple imputation for the regression analyses. Detailed demographic characteristics based on available responses prior to imputation for this analytic sample are presented in Table 1.

Bivariate correlations, presented in Table 2, revealed initial associations between the study variables. Notably, and in line with the final regression models, greater LGBTQ+ belongingness was significantly and positively correlated with lifetime illicit drug use (r = 0.18, $p < 0.01$) but was significantly and negatively correlated with past-year alcohol consumption frequency (r = –0.15, $p < 0.01$). Additionally, identifying as TGE was strongly correlated with higher odds of lifetime illicit drug use (r = 0.25, $p < 0.01$).

3.2. Regression Analyses

The binary logistic regression analysis revealed that greater LGBTQ+ belongingness was significantly associated with higher odds of reporting lifetime illicit drug use (OR = 1.24, 95% CI [1.05, 1.47], $p = 0.010$). Examining the covariates, being 31 years or older (compared to 18–30 years) was associated with lower odds of illicit drug use (OR = 0.40, 95% CI [0.28, 0.57], $p < 0.001$). Identifying as TGE (compared to cisgender) was associated with higher odds of illicit drug use (OR = 3.20, 95% CI [2.24, 4.58], $p < 0.001$). Having a household income of USD 100,000 or more (compared to <USD 100k) was associated with lower odds of illicit drug use (OR = 0.64, 95% CI [0.45, 0.91], $p = 0.014$). Education level was not significantly associated with illicit drug use in the model (OR = 0.93, 95% CI [0.68, 1.30], $p = 0.705$). The average Nagelkerke R^2 across the 10 imputations was 0.156, suggesting that the included predictors accounted for approximately 15.6% of the variance in this model. Detailed statistics are presented in Table 3.

Table 3. Logistic regression predicting illicit drug use.

Predictor	B	*SE*	*p*	OR	95% CI
LGBTQ+ Belongingness	0.22	0.09	0.010	1.24	[1.05, 1.47]
Income	–0.45	0.18	0.014	0.64	[0.45, 0.91]
Education	–0.06	0.17	0.705	0.93	[0.68, 1.30]
Gender	1.16	0.18	<0.001	3.20	[2.24, 4.58]
Age	–0.92	0.19	<0.001	0.40	[0.278, 0.57]

Note. Reference groups for dichotomized predictors were as follows: Income (0 = <USD 100,000), Education (0 = Associate degree or less), Gender (0 = Cisgender), and Age (0 = 18–30 years).

The linear regression analysis indicated that greater LGBTQ+ belongingness was significantly associated with a lower frequency of alcohol consumption ($B = -0.094$, 95% CI [−0.159, −0.028], $p = 0.005$). The overall model significantly predicted alcohol consumption frequency ($F(5, 2947) = 80.97$, $p < 0.001$), accounting for approximately 12% of the variance (Pooled $R^2 = 0.12$). All covariates included in the model were significant predictors; being 31 years or older ($B = 0.70$, 95% CI [0.59, 0.82], $p < 0.001$), having an income of USD 100,000

or more (B = 0.15, 95% CI [0.05, 0.24], $p = 0.002$), having a bachelor's degree or higher ($B = 0.23$, 95% CI [0.01, 0.36], $p < 0.001$), and identifying as TGE ($B = 0.16$, 95% CI [0.00, 0.31], $p = 0.045$) were all associated with higher frequency of alcohol consumption. Detailed statistics are presented in Table 4.

Table 4. Linear regression predicting alcohol consumption.

Predictor	B	*SE*	*t*	*p*	95% CI
Constant	2.749	0.141	19.56	<0.001	[2.47, 3.03]
LGBTQ+ Belongingness	–0.094	0.033	–2.83	0.005	[–0.159, –0.028]
Income	0.149	0.048	3.08	0.002	[0.05, 0.24]
Education	0.227	0.065	3.48	<0.001	[0.10, 0.36]
Gender	0.155	0.077	2.02	0.045	[0.00, 0.31]
Age	0.702	0.059	11.85	<0.001	[0.59, 0.82]

Note. Reference groups for dichotomized predictors were as follows: Income (0 = <USD 100,000), Education (0 = Associate degree or less), Gender (0 = Cisgender), and Age (0 = 18–30 years).

4. Discussion

This study examined the association between psychological belongingness within the LGBTQ+ community and substance use among LGBTQ+ adults in Kentucky, revealing divergent patterns. Contrary to hypotheses framing belongingness as solely protective, greater belongingness was significantly associated with higher odds of reporting lifetime use of illicit drugs (cocaine, crack, heroin, or methamphetamine). This finding challenges simplistic views of community connection as universally beneficial against severe substance use. As discussed in the literature, while belongingness can buffer general stress, it might paradoxically connect individuals to specific community sub-networks where illicit drug use is more normative or where peer influence encourages substance use as a shared coping mechanism for profound minority stress, trauma, or the structural adversities prevalent in parts of Kentucky. It is also plausible that a selection effect is at play: individuals who have used illicit substances may be more motivated to seek out and connect with the LGBTQ+ community for acceptance and support, in which case higher belongingness would be a result of, rather than a cause of, a history of drug use. Conversely, and aligning more with protective hypotheses, greater belongingness was significantly associated with lower frequency of past-year alcohol consumption. These contrasting findings emerged after controlling for age, education, gender identity, and income.

The unexpected positive association between belongingness and lifetime illicit drug use necessitates careful interpretation within the Kentucky context. This finding challenges simplistic views of community connection as universally beneficial against severe substance use. As discussed in the literature, while belongingness can buffer general stress [4], it might paradoxically connect individuals to specific community sub-networks where illicit drug use is more normative, potentially as a shared coping mechanism for profound minority stress, trauma, or the structural adversities prevalent in parts of Kentucky [27,54,101]. Higher belongingness could also correlate with greater identity visibility, potentially increasing exposure to severe discrimination that triggers more extreme coping methods for some [26]. Furthermore, this finding aligns with research suggesting community engagement is not always protective and can sometimes amplify risk [10].

The lifetime illicit drug use measure, essential for capturing any high-risk history, complicates interpretation alongside current belongingness due to inherent temporal ambiguity. Past use could reflect varied historical contexts—such as earlier identity turmoil or differing community norms—predating current belongingness levels, potentially ceasing as belongingness later increased, or being unrelated to current psychosocial states. Consequently, the

temporal relationship between current belongingness and past illicit drug use episodes (i.e., which preceded or influenced the other) cannot be determined. The significantly higher odds among TGE participants underscore their heightened vulnerability [5,17], suggesting that even within potentially belonging-supportive communities, the unique and severe stressors faced by TGE individuals may sustain higher risks for illicit drug use. Protective effects of older age and higher income align with general population trends.

In contrast, the finding that greater LGBTQ+ belongingness predicted less frequent alcohol consumption aligns more closely with theories emphasizing the protective role of social integration and support [1,82,88]. A stronger internal sense of connection, affiliation, and companionship within the LGBTQ+ community [16] may bolster resilience against frequent drinking by mitigating daily stressors, reducing loneliness, enhancing adaptive coping [62,63], or fostering identity affirmation [3,87]. This result highlights the potential importance of distinguishing psychological belongingness, as measured by the LGBTQ BAS, from behavioral participation in potentially alcohol-centric community activities [9,97]. Individuals feeling securely connected may rely less on alcohol for social facilitation or stress management compared to those feeling isolated. This supports literature demonstrating belongingness's buffering effects against minority stress [4,61] and fostering resilience through shared identity [71]. For instance, individuals who feel securely connected and affirmed in their identity may rely less on alcohol for social facilitation, whereas those feeling isolated might be more likely to seek connection in settings like bars where alcohol use is a social norm.

The divergent findings for illicit drugs versus alcohol underscore the complexity noted previously in the literature: LGBTQ+ belongingness is not monolithic in its health associations. Its impact likely depends on the specific behavior, the nature of the community connection (psychological vs. behavioral, inclusive vs. exclusive, substance-focused vs. not), the substances involved (socially integrated like alcohol vs. highly stigmatized illicit drugs), and the specific socio-structural context. The factors driving lifetime illicit drug use (potentially linked to severe distress, trauma history, specific subcultures, or historical patterns) may differ fundamentally from those influencing current alcohol consumption frequency (perhaps more related to daily coping, social norms, and general well-being).

While these findings are specific to the socio-political context of Kentucky, they offer broader implications for international scholars, clinicians, and policymakers. The central finding—that community belongingness can have divergent health associations—is a crucial reminder for public health efforts globally. The need to belong is a fundamental human motivation, and for LGBTQ+ individuals facing societal stigma, community connection is a key determinant of health. However, our results caution against assuming this connection is universally protective. In any region where LGBTQ+ social life is intertwined with substance-using norms (e.g., bar-centric community spaces), belongingness may paradoxically increase risk for some behaviors (e.g., frequent alcohol use) while buffering against others (perhaps drug use linked to severe isolation). Furthermore, the heightened vulnerability of TGE individuals is a global public health concern. Therefore, clinicians and policymakers in any country can apply these insights by assessing the specific nature of an individual's community connection and developing nuanced, culturally aware interventions that foster resilience without inadvertently exposing vulnerable individuals to substance-related risks.

Regarding covariates, the consistent finding of higher substance use risk (lifetime illicit use odds and alcohol frequency) among TGE participants reinforces the need for TGE-specific research and interventions. The associations with age, income, and education likely reflect complex interactions between socioeconomic factors, life stage, and cultural norms. Specifically, older age predicted lower odds of lifetime illicit drug use, while

higher frequency of alcohol use may reflect cohort effects. Moreover, older LGBTQ+ adults have less lifetime exposure to illicit drug subcultures but may participate more in socially accepted forms of drinking. Similarly, the association of higher education with more frequent alcohol consumption aligns with broader population trends where higher socioeconomic status is often linked to more frequent, but not necessarily more problematic, alcohol use. These patterns warrant further intersectional investigation.

This study's strengths include its large sample of LGBTQ+ adults specifically from Kentucky, an understudied and high-risk region. Utilizing the validated, multidimensional LGBTQ BAS provides a robust measure of psychological belongingness. The simultaneous examination of distinct substance use outcomes (lifetime illicit vs. past-year alcohol frequency) allows for a nuanced analysis of belongingness's complex role. Furthermore, controlling for key demographic covariates addresses intersectionality to some extent, and the use of multiple imputation rigorously handles missing data.

Several limitations must be acknowledged. First, the cross-sectional design is a significant constraint that precludes causal inferences; we cannot determine if belongingness influences substance use, vice versa, or if both are shaped by unmeasured factors [121]. This cross-sectional limitation is particularly acute when linking current LGBTQ+ belongingness with lifetime illicit drug use. The lifetime drug measure versus the current belongingness assessment precludes establishing a temporal sequence. Past drug use might have occurred under different historical psychosocial conditions, predating current belongingness, or perhaps ceased as belongingness evolved.

Second, convenience and snowball sampling may limit generalizability, potentially overrepresenting those connected to community networks [3]. Furthermore, the demographic composition of the achieved sample also impacts generalizability to the broader LGBTQ+ population in Kentucky. Our sample was predominantly White, identified largely as cisgender gay men, and reported high levels of educational attainment. Consequently, the findings may not fully represent the experiences of LGBTQ+ Kentuckians of color, TGE individuals, or those with lower socioeconomic status. While data on race and ethnicity were collected, the small number of participants of color precluded the inclusion of race as a predictor in our multivariate models. Such an analysis would have been statistically underpowered, risking unstable estimates and potentially masking the true effects of compounded stressors faced by LGBTQ+ people of color. Therefore, we made the deliberate decision to omit this variable from the primary models to avoid drawing potentially erroneous conclusions. Future research must prioritize recruitment strategies that oversample LGBTQ+ people of color to enable robust, intersectional analyses that can meaningfully inform culturally specific interventions.

Third, all substance use data were based on self-report, which is subject to recall bias, particularly for lifetime illicit use, and social desirability bias [45], which may lead to an underreporting of stigmatized behaviors. Fourth, the substance use measures were basic, lacking detail on quantity, severity, problematic use patterns, or recency for illicit drugs, which limits the depth of our findings. Fifth, dichotomizing covariates reduced statistical nuance. Sixth, the LGBTQ BAS assesses general LGBTQ+ belongingness and could not capture potentially differing experiences within specific intersectional communities [75] or affiliation with riskier subcultures [10]. Seventh, our analytic approach to gender identity, while necessary for statistical power, has notable limitations. By dichotomizing gender identity into a cisgender versus TGE variable, we were unable to examine the distinct experiences of transgender men, transgender women, and nonbinary individuals, who face unique minority stressors. Similarly, we did not include sexual orientation as a separate predictor in the multivariate models. This decision was made to maintain model parsimony and to focus on the primary theoretical contrast between cisgender and TGE experiences,

which often represent different dimensions of minority stress. However, we recognize that this approach does not account for the rich diversity within the LGBTQ+ community, such as the unique vulnerabilities of bisexual individuals or potential differences between gay versus straight transgender individuals. Future research with larger samples should prioritize more granular analyses, including interaction terms between gender identity and sexual orientation, to better understand these complex, intersectional effects on substance use. Finally, this study lacked measures of specific minority stressors, mental health status, trauma history, peer norms, detailed structural factors (e.g., rurality index), or key mediators like coping motives, limiting our ability to fully explain the observed associations. Findings are specific to Kentucky and may not generalize elsewhere.

Despite limitations, findings offer important implications. Theoretically, they reinforce the need for context-dependent models of belongingness that account for substance type, intersectionality, quality versus quantity of connection, and the surrounding social/structural environment, incorporating strengths-based frameworks alongside risk-focused perspectives [2,7,88]. Belongingness's relationship with health behaviors is complex. Clinically and practically, interventions promoting LGBTQ+ belongingness must be nuanced. While fostering connection may aid in reducing frequent alcohol use, strategies must be vigilant about potentially harmful norms within certain community segments that might facilitate illicit drug use, especially for vulnerable subgroups like TGE individuals. Creating affirming, substance-aware, and recovery-supportive LGBTQ+ spaces is crucial [95,111]. Clinicians in Kentucky should screen for diverse substance use patterns, assess the nature and quality of clients' community connections, utilize trauma-informed approaches [27], and leverage peer support models [122]. Addressing loneliness and enhancing positive social identity may also be beneficial [90,92]. Policy-wise, findings support advocating for statewide non-discrimination protections to reduce underlying minority stress [42,43], increasing funding for LGBTQ+ community centers and affirming services, promoting harm-reduction strategies tailored for LGBTQ+ populations [123], investing in Kentucky's overall SUD treatment infrastructure with equitable rural access [14], and improving sexual orientation/gender identity data collection in state surveillance [115].

Future research should prioritize longitudinal designs [58,121] to establish causality between belongingness, stressors, and substance use trajectories. Qualitative studies are essential to explore the lived experiences behind these quantitative findings among diverse LGBTQ+ Kentuckians, particularly comparing urban and rural contexts and examining TGE experiences [70]. Research should explicitly investigate intersections of LGBTQ+ identity, rurality [32], economic hardship [27], and specific drug trends in Kentucky. Examining how belongingness interacts with peer influences [122], motivation to change [124], and navigation of Kentucky's treatment system [116] is crucial. Furthermore, future work should use these findings to develop and evaluate interventions designed to foster health-promoting belongingness within Kentucky's LGBTQ+ communities, such as evaluating substance-free community events or LGBTQ-affirming peer support groups. Methodologically, mapping the characteristics of social networks could provide a deeper understanding of how the quality and structure of community connections influence substance use risk and resilience. Measurement needs refinement to capture belongingness quality/context, differentiate participation types, assess problematic use severity, and include key mediators (e.g., mental health status, trauma history, and coping motives). Testing moderation by race/ethnicity, specific gender identities and sexual orientations, and trauma history is vital. Finally, developing and evaluating interventions designed to foster health-promoting belongingness within Kentucky's LGBTQ+ communities is a crucial next step [90,92].

5. Conclusions

In conclusion, this study reveals divergent associations between psychological LGBTQ+ community belongingness and substance use among LGBTQ+ adults in Kentucky. While greater belongingness was linked to less frequent alcohol consumption, potentially reflecting its role in fostering resilience, it was also unexpectedly associated with higher odds of lifetime illicit drug use. These findings underscore the complex, context-dependent nature of belongingness and highlight the need for nuanced research and tailored interventions that acknowledge both the potential benefits of community connection and the intersecting structural vulnerabilities, specific substance use patterns, and diverse experiences within this population, particularly within the challenging environment of Kentucky. By acknowledging these complex dynamics, stakeholders can better design interventions and policies that maximize the benefits of LGBTQ+ community connectedness while minimizing potential risks.

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Abbreviations

The following abbreviations are used in this manuscript:

BAS	LGBTQ Belongingness Attainment Scale
LGBTQ+	Lesbian, Gay, Bisexual, Transgender, Queer, and other sexual and gender minority
MICE	Multiple Imputation by Chained Equations
MOUD	medications for opioid use disorder
SUDs	substance use disorders
TGE	transgender and gender expansive
VIF	Variance Inflation Factor

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