Intimate partner violence is related to future alcohol use among a nationwide sample of

LGBTQIA+ people: results from The PRIDE Study

ABSTRACT

Background: Lesbian, gay, bisexual, transgender, queer, intersex, aromantic and asexual (LGBTQIA+) communities in the United States experience higher rates of alcohol use than the general population. While experiencing intimate partner violence (IPV) is thought to lead to increased alcohol use in LGBTQIA+ people, little research has investigated the temporal relationship between IPV and alcohol use in this population.

Methods: Data from two annual questionnaires of The Population Research in Identity and Disparities for Equality Study (The PRIDE Study) longitudinal cohort (n=3,783) were included. Overall IPV and three sub-types (physical, sexual, and emotional) - measured in 2021 using the extended Hurt, Insult, Threaten, Scream (E-HITS) screening tool - was examined as a predictor of Alcohol Use Disorders Identification Test (AUDIT) score in 2022 using multivariable linear regression to assess linear and quadratic associations. Models were adjusted for sociodemographic characteristics and history of alcohol use.

Results: One-quarter (24.7%) of respondents reported experiencing past-year IPV in 2021. The mean AUDIT score in 2022 was 3.52 (SD = 4.13). In adjusted models, both linear (*B*: 0.26, 95% CI: 0.14, 0.38) and quadratic (*B*: -0.03, 95% CI: -0.04, -0.01) terms for overall IPV were significantly associated with next-year AUDIT score. These patterns were mirrored in each IPV sub-type, were not attenuated when accounting for relationship characteristics, and were heterogeneous across gender identity groups.

Conclusions: These results provide evidence of a temporal relationship between IPV and alcohol use in LGBTQIA+ communities, suggesting that efforts to prevent and mitigate IPV may help reduce alcohol use disparities in this population.

1.   INTRODUCTION

Intimate partner violence (IPV) is a significant public health problem in lesbian, gay, bisexual,

transgender, queer or questioning, intersex, aromatic and asexual (LGBTQIA+) communities in

the United States (US; Whitfield et al., 2021). Defined as any action within a romantic

relationship that causes physical, sexual, or emotional harm, as many as 61.1% of sexual minority

women and 37.3% of sexual minority men in the US have experienced IPV, compared to 35%

and 29% of heterosexual women and men, respectively (Leemis et al., 2022). Moreover, findings

from a recent systematic review and meta-analysis show transgender people are more than twice

as likely to experience IPV than their heterosexual, cisgender counterparts (Peitzmeier et al.,

2020). To address this disproportionate public health burden, the US White House released its

first National Action Plan to End Gender-based Violence in 2023, which calls for more research

into the health impacts of IPV specifically in these communities to develop novel interventions

tailored to LGBTQIA+ relationships (The White House, 2023).

Minority stress is thought to be a significant driver of negative health outcomes (including IPV) in

LGBTQIA+ populations (Decker et al., 2018; Edwards et al., 2015; Swann et al., 2022). The

Minority Stress Model posits that health disparities among LGBTQIA+ people exist in part due

to the stress from navigating discrimination, prejudice, and stigma experienced due to their

minority identity (Brooks, 1981; Hendricks & Testa, 2012; Meyer & Frost, 2013; Meyer, 2003). In

response to the excess proximal (e.g., internalized homo- and transnegativity) and distal (e.g.,

hate crimes, discrimination) stress of existing as an LGBTQIA+ person in a society dominated by

cisgender, heterosexual men (i.e., cisheteropatriarchy), LGBTQIA+ people may use substances

such as alcohol to cope (Flentje et., 2020). Among potential stress-response behaviors, alcohol

use is one of the most widely researched behaviors, and evidence indicates a disproportionately

high rate of alcohol use and binge drinking among LGBTQIA+ communities (Dyar et al., 2020;

Gosling et al., 2022; Hatzenbuehler, 2009; Hoy-Ellis, 2023; Lee et al., 2016; Wolfe et al., 2021).

LGBTQIA+ adults are also significantly more likely to be diagnosed with an alcohol use disorder

than their cisgender, heterosexual counterparts (Hughto et al., 2021; Krueger et al., 2020). Some

LGBTQIA+ people may adopt alcohol use to self-manage other effects of minority stress, such as

depressive symptoms (Tebbe & Budge, 2022).

Despite LGBTQIA+ people having both high rates of alcohol use and IPV, little research has

investigated the temporal relationship between IPV and alcohol use in these populations. IPV is

often found to be associated with alcohol use in specific LGBTQIA+ subgroups (*e.g.,* cisgender

sexual minority men, cisgender sexual minority women; Basting et al., 2023; Davis et al., 2016;

Kimmes et al., 2019; King et al., 2022), but current knowledge of the role that IPV plays in

alcohol use among LGBTQIA+ people is limited by cross-sectional designs and a preponderance

of evidence focusing on cisgender men who have sex with men (Kim & Schmuhl, 2021; Porsch et

al., 2022). A broader limitation within the IPV literature is the binary way in which IPV is

commonly analyzed, especially in sexual and gender minority communities (Follingstad & Ryan,

2013; Smith et al., 2015). Previous research recommends modeling changes in substance use as

both a constant process (i.e., a linear relationship) as well as one that includes gradual

acceleration or deceleration in use (i.e., a curvilinear relationship) to capture the complex and

dynamic aspects of both violence and substance use. (Ahmadabadi et al., 2019; Brown et al.,

2005; Cafferky et al., 2018;), but the more nuanced effect of the continuum of IPV experiences remains largely unexplored in LGBTQIA+ people. Together, these issues preclude researchers from drawing causal inferences and developing effective, evidence-informed interventions for alcohol use for LGBTQIA+ communities that are inclusive of theeffects their relationship experiences may have on their substance use behaviors.

While we know of no studies examining the temporal relationship between IPV and increases in alcohol use in LGBTQIA+ people, substantial evidence finds that experiencing IPV leads to increased alcohol use among cisgender women in relationships with cisgender men (La Flair et al., 2012; Ogden et al., 2022). Feminist examinations of these results find that likely mechanisms for increased alcohol use include structural factors such as gender inequality and coping from the stress of abuse. Given similar structural forces through which oppression moves in queer communities (*i.e.,* minority stress), even despite different interpersonal factors within these relationships compared to heterosexual ones, LGBTQIA+ couples may turn to alcohol to self-manage the effects of minority stress and IPV (Stubbs & Szoeke, 2022; White et al., 2023).

The purpose of this study was to identify the temporal relationships between IPV experiences among LGBTQIA+ people and subsequent alcohol use. We hypothesize that LGBTQIA+ people who report past-year IPV will have higher rates of alcohol use in the subsequent year and that the frequency of violence will have a dose-response effect across LGBTQIA+ communities. This may begin to illustrate the role of IPV in alcohol use disparities among LGBTQIA+ people, add more rigorous evidence on which to build effective interventions for the reduction of substance

use in LGBTQIA+ communities broadly, and contribute to the successful completion of the US

National Action Plan to reduce IPV.

2. METHODS

2.1 Study Design and Participants

The PRIDE Study (www.pridestudy.org) is a community-engaged, prospective, online cohort

study of LGBTQIA+ adults, described previously (Lunn, Capriotti, et al., 2019; Lunn, Lubensky,

et al., 2019). Briefly, The PRIDE Study began recruitment in 2017 through LGBTQIA+

community events, partners, organizations, and social media. Eligible participants had to be age

≥ 18 years, reside in the US or its territories, identify as LGBTQIA+ or another gender and/or

sexual minority person, and be comfortable with reading and understanding English. All

participants provided informed consent through the web-based portal. Upon enrollment,

participants are invited to complete the lifetime and current annual health and experiences

questionnaire with annual invitations to complete subsequent annual questionnaires. For this

study, we included participants who completed the 2021 (administered July 2021-May 2022) and

2022 (administered June 2022-May 2023) annual questionnaires (The PRIDE Study, 2024),

hereafter referred to by the year that their administration began. The PRIDE Study was approved

by the [BLINDED FOR REVIEW] Institutional Review Boards.

2.2 Exposures

The primary exposure is the Extended-Hurt, Insulted, Threaten, Scream (E-HITS) (Chan et al.,

2010; Iverson et al., 2015) scale reported in the 2021 annual questionnaire. The E-HITS is a 5-

item screening tool that assesses for past-year IPV by asking participants: "Over the last 12

months, how often did your partner: (1) physically hurt you?, (2) insult you or talk down to you?,

(3) threaten you with harm?, (4) scream or curse at you?, and (5) force you to have sexual

activities?" Responses are scored on a 5-point scale (1 = never to 5 = frequently), resulting in

summed score ranging from 5 to 25 (Cronbach's alpha = 0.71). We classified the E-HITS items

into three subtypes which measured physical (items 1 and 3), sexual (item 5), and emotional

(items 2 and 4) past-year IPV. The total scores for physical and emotional IPV ranged from 2 to

10. While E-HITS subscales have not been formally validated, previous psychometric data using

cisgender, female participants found no statistical differences between the sensitivity and

specificity of the E-HITS compared to the 'gold standard' Conflict Tactics Scale-2 in detecting

IPV overall or its sub-types, providing preliminary justification for using the E-HITS to screen for

IPV typology (Iverson et al., 2015).

2.3 Outcome

The main outcome of interest is the Alcohol Use Disorders Identification Test (AUDIT)

(Saunders et al., 1993) scale reported in the 2022 annual questionnaire. The AUDIT is a 10-item

screening tool that assesses the level of alcohol consumption and dependence in the past year.

Items for the AUDIT include the quantity and frequency of drinking and heavy drinking (items 1

to 3); impaired control over drinking, increased salience of drinking, and morning drinking (items

4 to 6); and resulting problems from alcohol, such as guilt after drinking, blackouts, alcohol-

related injuries, and whether others are concerned about the participant's drinking (items 7 to 10).

Participants respond to each item on a 5-point scale (0 = Never to 4 = Daily or almost daily),

except for items 9 and 10 which are scored with values of 0 (No), 2 (Yes, but not in the past year),

and 4 (Yes, during the last year). The total scores range from 0 to 40 (Cronbach's alpha = 0.78).

2.4 History of Alcohol Use

We used two self-reported measures from the 2021 annual questionnaire to assess history of

alcohol use: past-year alcohol use and alcohol use disorder. Participants are asked "How often did

you have a drink containing alcohol in the PAST YEAR?" Responses were based on an ordinal

scale from "Never" (0) to "4 or more times a week" (4). We dichotomized past-year alcohol use

as any or never. Baseline alcohol use disorder was identified using the following question: "Do

you currently have any of the following conditions that have been diagnosed by a health care

provider?" Participants who selected "Alcoholism or Alcohol Use Disorder" were categorized to

have experienced alcohol use disorder at baseline.

2.5 Relationship Variables

Questions on participants' current relationship status were obtained in the 2021 annual

questionnaire. Participants were asked the following question: "Are you currently in a

relationship?" Those who answered "yes" were asked about their general satisfaction with their

current romantic relationships: "In general, how satisfied are you with your current romantic

relationship(s)?" Responses were on a 5-point Likert scale, ranging from 0 (Very dissatisfied) to 4

(Very satisfied).

2.6 Socio-demographics

We included the following socio-demographic characteristics in our analysis from the 2021

questionnaire: age (continuous), ethnoracial identity with the option to select multiple responses

(American Indian or Alaska Native; Asian; Black, African American or African; Hispanic,

Latino, or Spanish; Middle Eastern or North African; Native Hawaiian or other Pacific Islander;

White; and Another), education level (high school or less, some college, 4-year degree, master's

degree, and doctorate/professional degree), employment (yes/no), individual income ($0-20,000,

$20,001-50,000, $50,001-100,000, and $100,001+), and Census region (Northeast, Midwest,

South, and West). Gender identity was assessed using a question "*What is your current gender

identity?*" with the option to select multiple responses (agender, cisgender man, cisgender

woman, genderqueer, man, non-binary, questioning, transgender man, transgender woman, Two-

spirit, woman, and another write-in response). We then used a two-step procedure (Tate,

Ledbetter & Youssef, 2013) to cross-classify participants' responses to gender identity and sex

assigned at birth (female or male) into the following gender groups: cisgender men, cisgender

women, gender diverse individuals assigned female at birth, gender diverse individuals assigned

male at birth, transgender men, and transgender women. Sexual orientation was assessed using a

question "*What is your current sexual orientation*" with the option to select multiple responses

(asexual, bisexual, gay, lesbian, pansexual, queer questioning, same-gender loving, heterosexual,

Two-spirit, and another write-in response. These responses were grouped into the following

categories: asexual, bisexual, gay or lesbian, pansexual, queer, heterosexual, multiple options

selected, or endorsed only another sexual orientation, same-gender loving, or questioning.

2.7 Statistical Analysis

We first described key participant characteristics for the overall sample using descriptive

statistics. To assess associations between past-year IPV in 2021 and subsequent AUDIT scores

reported in 2022 annual questionnaire, we fitted separate linear regression models for each

exposure and used a sandwich estimator to obtain robust standard errors. To test our hypothesis

regarding the association of IPV frequency on alcohol use, IPV was modeled as both linear and

quadratic terms. The best fitting models were determined using the likelihood ratio test

comparing linear and quadratic models. Adjusted models accounted for age, gender groups,

sexual orientation groups, education, employment, individual income, history of alcohol use, and

Census region. To improve model fit, we mean-centered overall E-HITS and its subtypes. Socio-

demographics and history of alcohol use of participants who were excluded due to missing E-

HITS or AUDIT are reported in Supplemental Table 1. Among the analytic sample, missing data

for covariates ranged between 0.03% (education level or employment) and 1.9% (past-year

alcohol use), which was accounted for using multiple imputation by chained equations. Using the

mice package (van Buuren & Groothuis-Oudshoorn, 2011), we generated and pooled across 20

imputed data sets to obtain a single estimate and 95% confidence interval (CI).

While currently being in a relationship was not a prerequisite for inclusion in the analysis,

relationship status is an important marker of IPV; those currently in a relationship were more

likely to report IPV and more severe forms of IPV than those who were not currently in a

relationship (Carvalho et al., 2011; Sutton & Dawson, 2021). We conducted a sensitivity analysis

by restricting the sample to those who reported currently being in a relationship and included

relationship satisfaction as a covariate in these models. There may be important gender

differences in IPV victimization and how it is associated with alcohol use within the LGBTQIA+

community (Caldwell et al., 2012; Reuter et al., 2017), but limited research has focused on these

differences (Scott et al., 2023). Thus, we stratified our results by the gender groups mentioned

above. We used R version 4.2.1 to perform all analyses. Interpretation of the data is based on an

evaluation of magnitude, direction, and precision of the observed associations. Therefore, some

significant results include zero due to rounding

3. RESULTS

A total of 4,495 participants initiated both the 2021 and 2022 annual questionnaires. Of these, we

included all individuals who self-reported their gender identity and sexual orientation (n =

4,488). We excluded 705 participants with any missing E-HITS or AUDIT items. Distribution of

socio-demographics and history of alcohol use were similar between included participants and

those excluded due to missing E-HITS and AUDIT items (Supplemental Table 1). However, a

higher proportion of excluded participants had missing values for education level, employment,

income, and past-year alcohol use, and a lower proportion identified as White. The final analytic

sample for this analysis was 3,783.

Sample characteristics are summarized in Table 1. The mean current age was 39.1 years (standard

deviation [SD] = 14.9). Approximately 49% of participants were transgender or gender diverse,

and 47% endorsed multiple sexual orientations. Most participants (92%) identified as White,

which included 3,107 people who only reported White (82.1% of sample) and 371 participants

who selected White in addition to another ethnoracial identity (9.8% of sample). Participants

predominately reported having at least a four-year college degree (78%) and being currently

employed (73%); however, 58% reported an individual income of less than $50,000. Participants

were also geographically diverse with a higher proportion of individuals currently residing in the

Pacific region (33%). Two-thirds (66%) reported currently being in a relationship, and among

those, 57% reported being satisfied or very satisfied with their current relationship. At baseline

(2021), about 79% reported past-year alcohol use, and 4% reported alcohol use disorder. The

mean overall E-HITS score was 5.65 (SD = 1.60). Approximately one-quarter (24.7%) of

respondents reported experiencing past-year IPV in 2021. Among subtypes, 3.5% reported

physical IPV with a mean score of the two physical IPV items of 2.06 (SD = 0.42). One-fifth

(20.4%) reported sexual IPV using its relevant single item measure (M=1.32, SD = 0.73), and

23.9% reported emotional IPV with the mean of these two items of 2.54 (SD = 1.24). In the

subsequent 12 months (2022 annual questionnaire), the mean AUDIT score was 3.52 (SD =

4.13).

In adjusted models, both linear (*B*: 0.26, 95% CI: 0.14, 0.38) and quadratic (*B*: -0.03, 95% CI: -

0.04, -0.01) terms for overall IPV were significantly associated with AUDIT scores (Table 2).

This indicates a linear increase, but at a lower rate after E-HITS scores exceed 10 points.

indicates our (see Figure 1a). Among IPV subtypes for the overall sample, patterns of

associations with AUDIT largely reflected those of overall IPV, with AUDIT scores increasing

with respect to all subtypes, but at a lower rate at higher E-HITS scores. Sexual IPV (Figure 1b)

showed the largest association with AUDIT (linear *B*: 1.47, 95% CI: 0.39, 2.55 & quadratic *B*: -

0.55, 95% CI: -0.94, -0.16), followed by physical IPV (linear *B*: 0.57, 95% CI: -0.02, 1.15 &

quadratic *B*: -0.12, 95% CI: -0.25, 0.01) and emotional IPV (linear *B*: 0.36, 95% CI: 0.18, 0.55 &

quadratic b: -0.07, 95% CI: -0.11, -0.02) (Figure 1c and 1d).

Among participants with available information on current relationship status (n = 3,757), there

were few differences in sociodemographic characteristics, IPV, and history of alcohol use by

current relationship status (Supplemental Table 2). Sensitivity analysis indicated that results did

not substantially change after accounting for relationship status and satisfaction (Supplemental

Table 3). Upon stratifying by gender groups, we observed considerable variation in the

associations of past-year IPV and its subtypes with AUDIT (Supplemental Figure 1-4,

Supplemental Table 4). Nonlinear patterns of associations were not consistent across gender

identity groups or IPV typology. Among cisgender men, we observed these nonlinear

associations for overall IPV (linear: *B*: 0.57, 95% CI: 0.28, 0.87 & quadratic: *B*: -0.05, 95% CI: -

0.09, -0.01) and emotional IPV (linear: *B*: 0.75, 95% CI: 0.34, 1.16 & quadratic: *B*: -0.11, 95%

CI: -0.21, 0.00,). For cisgender women, we observed nonlinear associations for physical IPV

(linear: *B*: 2.28, 95% CI: 0.32, 4.24 & quadratic: *B*: -0.81, 95% CI: -1.58, -0.04) and sexual IPV

(linear: *B*: 5.52, 95% CI: 2.45, 8.79 & quadratic: *B*: -2.15, 95% CI: -3.53, -0.78). For transgender

men, we observed nonlinear associations for emotional IPV (linear: *B*: 0.56, 95% CI: 0.05, 1.07

& quadratic: *B*: -0.12, 95% CI: -0.24, 0.00). We did not observe significant associations between

past-year IPV with subsequent AUDIT for other gender identity groups and IPV typology.

4. DISCUSSION

The results of this study provide some of the first data on the temporal relationship between IPV

and alcohol use among LGBTQIA+ people in the US. While previous work with cisgender,

heterosexual women suggests that the stress resulting from IPV may result in incident increases in

alcohol use (Abbey et al., 2004; Ogden et al., 2022), this relationship was largely unexplored in

LGBTQIA+ relationships prior to this study. The results reported here add to the evidence

concerning the role of IPV in substance use among LGBTQIA+ people and provide insight into

potential points of intervention for the reduction of alcohol use in these communities and adding

to the goals of the National Action Plan.

The results indicate that reporting any of the measured forms of violence in the past year is related to a subsequent higher AUDIT score of 0.26 points. When broken down by typology, experiencing sexual violence had the strongest relationship with alcohol use and was related to greater AUDIT scores (1.47 points per sexual E-HITS point, recalling that E-HITS is a measure of the frequency of violence). Experiencing physical violence was associated with greater AUDIT scores of more than half of a point (0.57), while reporting emotional violence resulted in higher AUDIT scores of more than a third of a point (0.36). These are consistent with studies of cisgender, heterosexual women, in which findings indicated increases in alcohol use in the year following IPV (La Flair et al., 2012; Ogden et al., 2022). However, the differential effects by typology should be interpreted with caution given the fact that the E-HITS scale is designed as a screening tool for IPV and is not reflective of the full breadth of violence types experienced by LGBTQIA+ populations. Together, these findings suggest that preventing IPV and mitigating its harms could be part of multi-pronged strategies to decrease future alcohol use in LGBTQIA+ communities.

Conditioning on relationship status and satisfaction did not significantly attenuate the results found in the larger sample, a null finding which has important implications for future IPV research. One common limitation of IPV research in LGBTQIA+ populations is that samples are limited to those who reported currently being in a relationship (Juwono et al., 2023; Mustanski et al., 2019). However, those who were not currently in a relationship may have recently experienced IPV and, in fact, may not be in a relationship for precisely that reason. This sub-analysis suggests that inclusion criteria for IPV-related research should be agnostic to current relationship status. Individual-level interventions designed to understand patterns of relationships

(*e.g.,* partner selection, communication skills, relationship functioning) may help those not currently in a relationship to be more mindful about future relationships, reducing their propensity to enter a(nother) violent relationship. While these types of individual interventions may provide some support, future work should concentrate on the context in which IPV occurs in order to change broader social norms (*e.g.*, minority stress) that undergird the *perpetration* of relationship violence.

In this study, we explored the relationship between IPV and alcohol use with linear and quadratic functions. There was a dose-response relationship between IPV and alcohol use until a value of approximately 10 points on the E-HITS scale. While the E-HITS ranges from 5-25, there are important variations in how a value of 10 can be calculated (*e.g.*, one person may endure frequent emotional violence accompanied by infrequent physical or sexual violence while another may endure rare instances of all five forms of violence measured). This initial glimpse into the dynamic relationship between IPV and alcohol use suggests that LGBTQIA+ people who experience lower scores on the E-HITS show increased levels of alcohol use, whereas those who have higher E-HITS scores show a more marginal effect on alcohol use beyond that already observed with mild-to-moderate alcohol use. There are several potential explanations for this finding. First, though we controlled for history of alcohol use at baseline, those who experience chronic IPV may already cope with these added stressors through heavier alcohol use , rendering alcohol use increases over the subsequent year marginal in nature. Second, those who experience more frequent IPV may turn to substances other than alcohol to cope with the additional stress of experiencing IPV. Previous studies suggest that men who have sex with men who report severe or frequent IPV have higher rates of illicit substance use (e.g., Wu et al., 2015) than those who

report less frequent or severe IPV (e.g., Gezinski et al., 2021). Third, frequent instances of IPV

often lead to the termination of a relationship, while less frequent instances of IPV are often

endured for longer periods of time (Ackerman & Field, 2011; Gelles, 1976; Raghavan et al.,

2005; Rhatigan et al., 2006), potentially compounding stress and leading to greater increases in

alcohol use. Thus, reporting less frequent IPV may be indicative of more chronic violence and

longer-term changes to the couple's relationship (*e.g.,* breakdown in communication patterns,

additional life stressors) that together lead to increased alcohol use. Interventions targeting IPV

and alcohol should make a concerted effort to include those experiencing IPV less frequently but

are enduring IPV less often as part of a broader constellation of relationship dysfunction (Bresin

et al., 2023). Importantly, this pattern varied by gender groups, meaning LGBTQIA+ should not

be treated as a monolith for intervention development. Among gender groups, we saw a similar

curvilinear pattern for cisgender men regarding overall and emotional IPV, for cisgender women

for physical and sexual IPV, and for transgender men for emotional IPV. As these complex

pathways are just now starting to be analyzed, additional research on how IPV may impact

substance use patterns is needed within the diverse identities that comprise the LGBTQIA+

community. This may lead to a better understanding of the mechanisms between IPV and alcohol

use, as well as how violence and alcohol use fit into diverse couples' broader relationship

contexts.

4.1 Strengths and Limitations

While this study contains important strengths - including its longitudinal design, robust methods,

geographically diverse sample, and theoretical grounding - there are important limitations to note.

First, the measure of IPV, the E-HITS scale, is an IPV screener and is not meant to capture the

full experience of IPV among LGBTQIA+ individuals. There are important forms of violence

(*e.g.*, "outing" or threatening to "out" someone, making fun of a partner based on gender

expression) that fall outside the traditional measures of IPV and remain unaccounted for in most

studies of IPV in these communities. Additionally, while preliminary evidence suggests the E-

HITS can be used to screen for specific typologies of violence, this is not psychometrically

validated in SGM people. Second, we did not control for other drug use or polydrug use, only

alcohol use. LGBTQIA+ people may turn to (multiple) substances other than alcohol to cope

with the stressors of existing as an LGBTQIA+ person in a cisheteropatriarchal society, as well as

the other stressors due to their other intersectional identities (e.g., race-, ethnicity- socio-

economic-based) that they may face. Future studies may query other substance use in relation to

IPV. Even without accounting for other substance use, it is important to understand how IPV is

related to alcohol use specifically given its ubiquitous nature in the US and high rates of use

among these communities. Third, while The PRIDE Study is a diverse sample in many ways,

certain racial and ethnic minority communities are underrepresented in this sub-sample, and

white participants are overrepresented compared to those excluded for data missingness. As such,

this study may not be generalizable to all LGBTQIA+ sub-groups. Finally, given that E-HITS

was only included in The PRIDE Study beginning in 2021, we were only able to model the

relationship between IPV on alcohol use across the two most recent years of the study. E-HITS

only screens for IPV victimization; mounting evidence suggests queer relationships may have

significant rates of bidirectional violence, meaning both members of a dyad perpetrate and

experience IPV (Kirschbaum et al., 2023; Machado et al., 2024). We may therefore be missing

the full spectrum of violence occurring in many participants' relationships, which could have

implications for alcohol use and intervention development. As The PRIDE Study cohort

continues, we will be able to draw longer-term inferences on the effects of IPV on alcohol use and may be able to assess additional violence-related constructs.

5. CONCLUSION

Our results suggest that many (~25%) LGBTQIA+ participants in The PRIDE study are affected by IPV, and this was related to alcohol use. Consistent with the Minority Stress Model, these results point to the need for additional research that can elucidate the means by which interpersonal and individual interventions can prevent and mitigate the harms of IPV.

This analysis represents a first step toward understanding the role of IPV in alcohol use among a marginalized and under-resourced population. By adding rigor to the existing evidence base, we aim to begin understanding the temporal relationship between violence and individual alcohol use outcomes. Our results demonstrate that experiencing IPV is related to increased alcohol use across a wide range of sexual and gender identities, providing a foundation on which to conduct additional analyses in specific communities that may yield important results for intervention development. Though exploratory in nature, this study is among the first to show the temporal relationship between IPV and alcohol use, paving the way for future interventions that include preventing and mitigating IPV as a component of broader interventions designed to reduce alcohol use disparities in LGBTQIA+ communities, achieve the goals of the National Action Plan (The White House, 2023), and lead to greater health equity for this population.

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TABLES

Table 1. Baseline participant characteristics, intimate partner violence (IPV), history of alcohol use, and AUDIT score at 1-year follow-up, The PRIDE Study 2021-2022

	Total (n = 3783)
Current age (years), mean (SD)	39.1 (14.9)
Gender identity,[a] no. (%)	
Agender	208 (5.5)
Cisgender man	643 (17.0)
Cisgender woman	892 (23.6)
Genderqueer	548 (14.5)
Man	784 (20.7)
Non-binary	980 (25.9)
Questioning	179 (4.7)
Transgender man	518 (13.7)
Transgender woman	214 (5.7)
Two-spirit	40 (1.1)
Woman	810 (21.4)
Another gender identity	257 (6.8)
Gender groups, no. (%)	
Cisgender man	929 (24.6)
Cisgender woman	998 (26.4)
Gender diverse, assigned female at birth	954 (25.2)
Gender diverse, assigned male at birth	138 (3.6)
Transgender man	541 (14.3)
Transgender woman	223 (5.9)
Sexual orientation,[a] no. (%)	
Asexual	440 (11.6)
Bisexual	1148 (30.3)
Gay	1290 (34.1)
Lesbian	841 (22.2)
Pansexual	602 (15.9)
Queer	1738 (45.9)
Questioning	88 (2.3)
Same-gender loving	173 (4.6)
Heterosexual	73 (1.9)
Two-spirit	29 (0.8)
Another sexual orientation	163 (4.3)
Sexual orientation groups, no. (%)	
Asexual	110 (2.9)
Bisexual	306 (8.1)
Gay or Lesbian	1123 (29.7)
Pansexual	96 (2.5)

Queer	310 (8.2)
Heterosexual	35 (0.9)
Multiple options selected	1780 (47.1)
Endorsed only Another sexual orientation, Same-gender loving, or Questioning	23 (0.6)
Ethnoracial identity,[a,b] no. (%)	
American Indian or Alaska Native	107 (2.8)
Asian	173 (4.6)
Black, African American or African	138 (3.6)
Hispanic, Latino or Spanish	227 (6.0)
Middle Eastern or North African	54 (1.4)
Native Hawaiian or other Pacific Islander	8 (0.2)
White	3478 (91.9)
Another ethnoracial identity	59 (1.6)
Education level, no. (%)	
High school or less	142 (3.8)
Some college	707 (18.7)
4-year college graduate	1322 (34.9)
Advanced degree	1611 (42.6)
Missing	1 (0.0)
Current employment, no. (%)	
No	1004 (26.5)
Yes	2778 (73.4)
Missing	1 (0.0)
Individual income, no. (%)	
$0-20,000	1095 (28.9)
$20,001-50,000	1109 (29.3)
$50,001-100,000	990 (26.2)
$100,001+	563 (14.9)
Missing	26 (0.7)
Current Census region, no. (%)	
Northeast	776 (20.5)
Midwest	770 (20.4)
South	962 (25.4)
West	1253 (33.1)
Missing	22 (0.6)
Currently in relationship, no. (%)	
No	1261 (33.3)
Yes	2496 (66.0)
Missing	26 (0.7)
Relationship satisfaction (n = 2496), no. (%)	
Very dissatisfied	49 (1.3)
Dissatisfied	111 (2.9)
Neutral	189 (5.0)
Satisfied	857 (22.7)

Very satisfied	1289 (34.1)
Experienced any IPV, no. (%)	936 (24.7)
Physical IPV, no. (%)	133 (3.5)
Sexual IPV, no. (%)	772 (20.4)
Emotional IPV, no. (%)	904 (23.9)
Overall E-HITS, mean (SD)	5.65 (1.60)
Physical E-HITS, mean (SD)	2.06 (0.42)
Sexual E-HITS, mean (SD)	1.32 (0.73)
Emotional E-HITS, mean (SD)	2.54 (1.24)
Past-year alcohol use, no. (%)	3005 (79.4)
Self-reported alcohol use disorder diagnosis, no. (%)	136 (3.6)
AUDIT, mean (SD)	3.52 (4.13)

[a] Participants could select multiple responses; thus, the sum of percentages is greater than 100%.

[b] Approximately 11% selected multiple ethnoracial identities.

SD, standard deviation; E-HITS, Extended-Hurt, Insulted, Threaten, Scream; IPV, intimate partner violence, AUDIT, Alcohol Use Disorders Identification Test.

Table 2. Adjusted associations between intimate partner violence (IPV) and its subtypes with AUDIT scores among the total sample, The PRIDE Study, 2021-2022 (n = 3783)

		Adjusted B	**95% CI**	**p-value[a]**
Overall intimate partner violence	E-HITS	0.26	0.14, 0.38	<0.001
	E-HITS^2 (quadratic)	-0.03	-0.04, -0.01	
Types of intimate partner violence	Physical E-HITS	0.57	-0.02, 1.15	0.073
	Physical E-HITS^2	-0.12	-0.25, 0.01	
	Sexual E-HITS	1.47	0.39, 2.55	0.005
	Sexual E-HITS^2	-0.55	-0.94, -0.16	
	Emotional E-HITS	0.36	0.18, 0.55	0.003
	Emotional E-HITS^2	-0.07	-0.11, -0.02	

Models adjusted for age, gender identity groups, sexual orientation groups, education level, employment, individual income, baseline Census region, past-year alcohol use and baseline self-reported alcohol use disorder diagnosis. All E-HITS measures were mean centered.

Abbreviations: AUDIT, Alcohol Use Disorders Identification Test; E-HITS, Extended-Hurt, Insulted, Threaten, Scream; CI, confidence interval.

[a] Compared models with and without quadratic term by pooling the likelihood-ratio test across multiply imputed data sets.

FIGURES
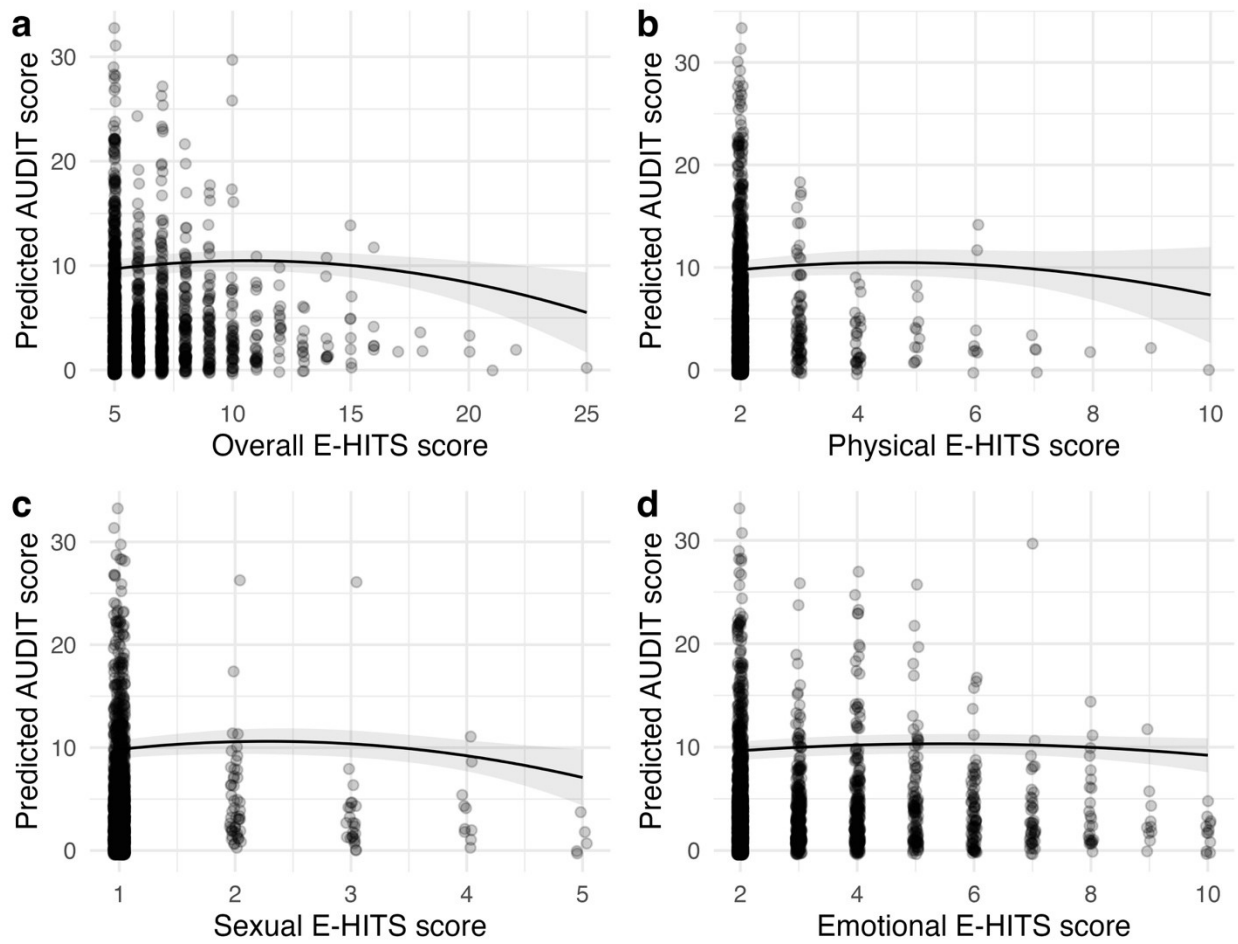
Figure 1. Model-predicted AUDIT scores at 1-year follow-up for a) overall E-HITS, b) physical E-HITS, c) sexual E-HITS, and d) emotional E-HITS. Fitted lines indicate predicted AUDIT scores, grey bands indicate 95% confidence intervals, black dots indicate raw AUDIT scores of individual participants. AUDIT, Alcohol Use Disorders Identification Test, E-HITS, Extended-Hurt, Insulted, Threaten, Scream.

SUPPLEMENTAL MATERIALS

Supplement to: Intimate partner violence is related to future alcohol use among a nationwide sample of LGBTQIA+ people: results from The PRIDE Study. *Drug Alcohol Depend.* 2024.

Figure 1. Association between *overall* intimate partner violence and AUDIT scores at 1-year follow-up across gender identity groups. Fitted lines indicate predicted AUDIT scores, grey bands indicate 95% confidence intervals, black dots indicate raw AUDIT scores of individual participants. AUDIT, Alcohol Use Disorders Identification Test; E-HITS, Extended-Hurt, Insulted, Threaten, Scream; AFAB, assigned female at birth; AMAB, assigned male at birth.

Figure 2. Association between *physical* intimate partner violence and AUDIT scores at 1-year follow-up across gender identity groups. Fitted lines indicate predicted AUDIT scores, grey bands indicate 95% confidence intervals, black dots indicate raw AUDIT scores of individual participants. AUDIT, Alcohol Use Disorders Identification Test; E-HITS, Extended-Hurt, Insulted, Threaten, Scream; AFAB, assigned female at birth; AMAB, assigned male at birth.
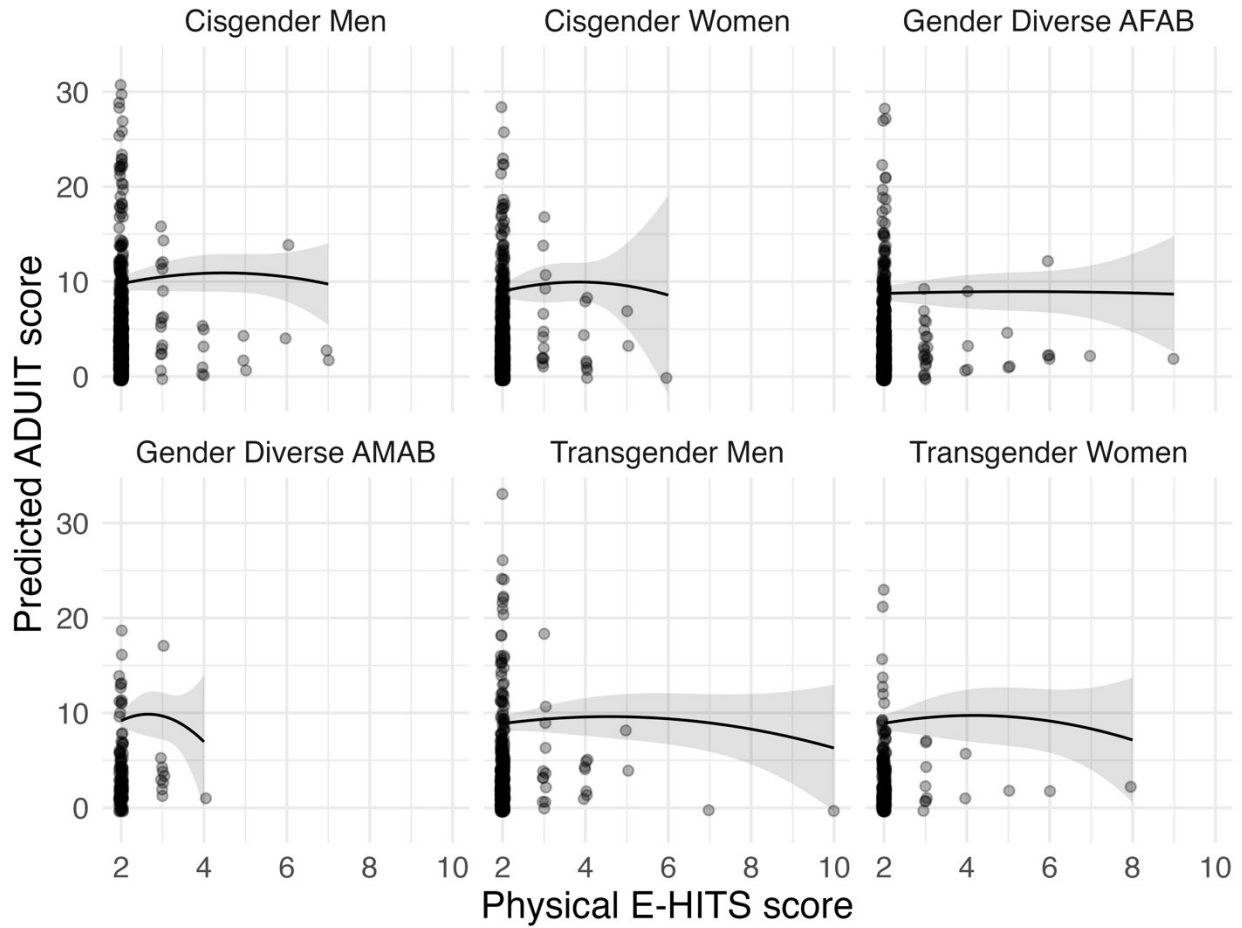
Figure 3. Association between *sexual* intimate partner violence and AUDIT scores at 1-year follow-up across gender identity groups. Fitted lines indicate predicted AUDIT scores, grey bands indicate 95% confidence intervals, black dots indicate raw AUDIT scores of individual participants. AUDIT, Alcohol Use Disorders Identification Test; E-HITS, Extended-Hurt, Insulted, Threaten, Scream; AFAB, assigned female at birth; AMAB, assigned male at birth.

Figure 4. Association between *emotional* intimate partner violence and AUDIT scores at 1-year follow-up across gender identity groups. Fitted lines indicate predicted AUDIT scores, grey bands indicate 95% confidence intervals, black dots indicate raw AUDIT scores of individual participants. AUDIT, Alcohol Use Disorders Identification Test; E-HITS, Extended-Hurt, Insulted, Threaten, Scream; AFAB, assigned female at birth; AMAB, assigned male at birth.
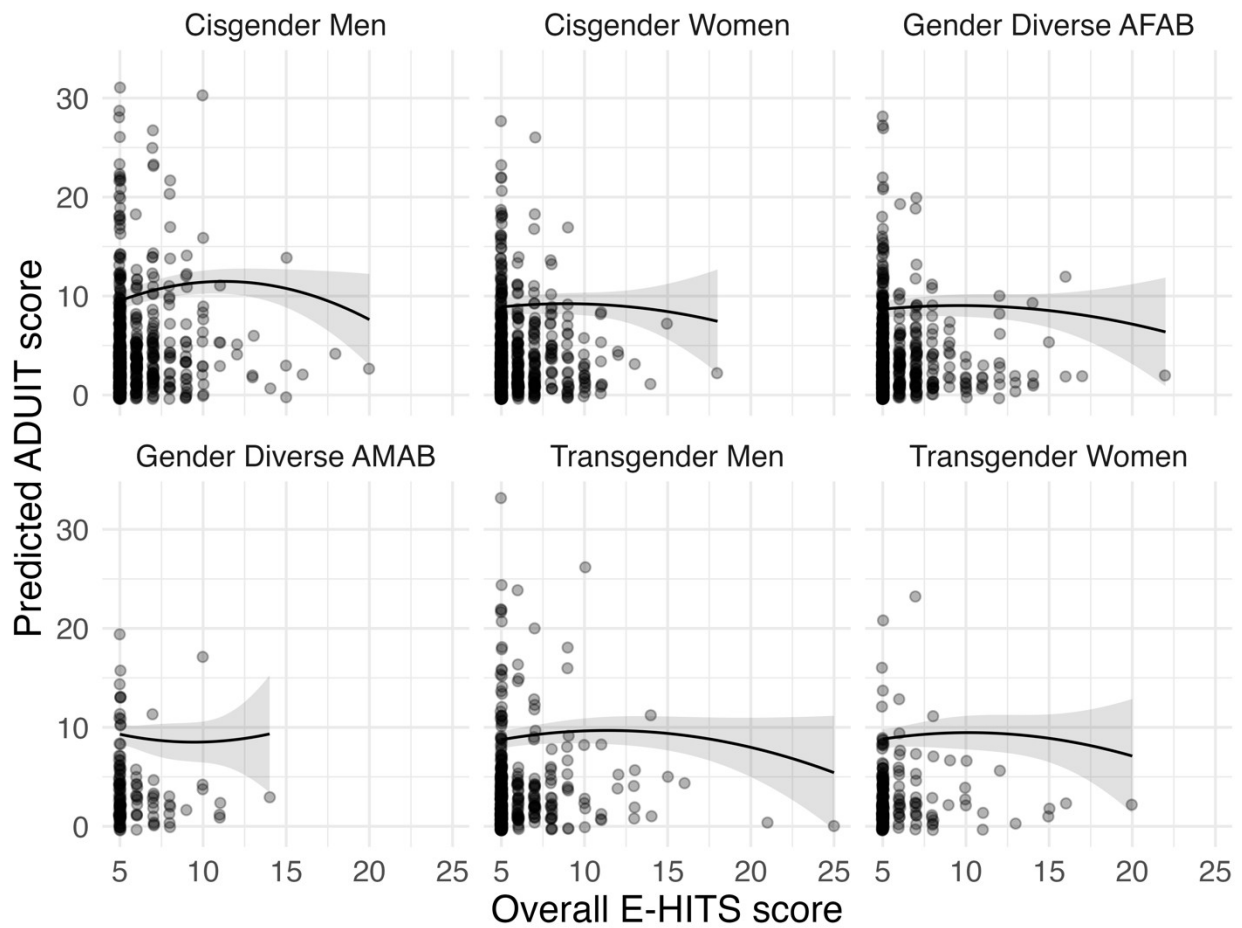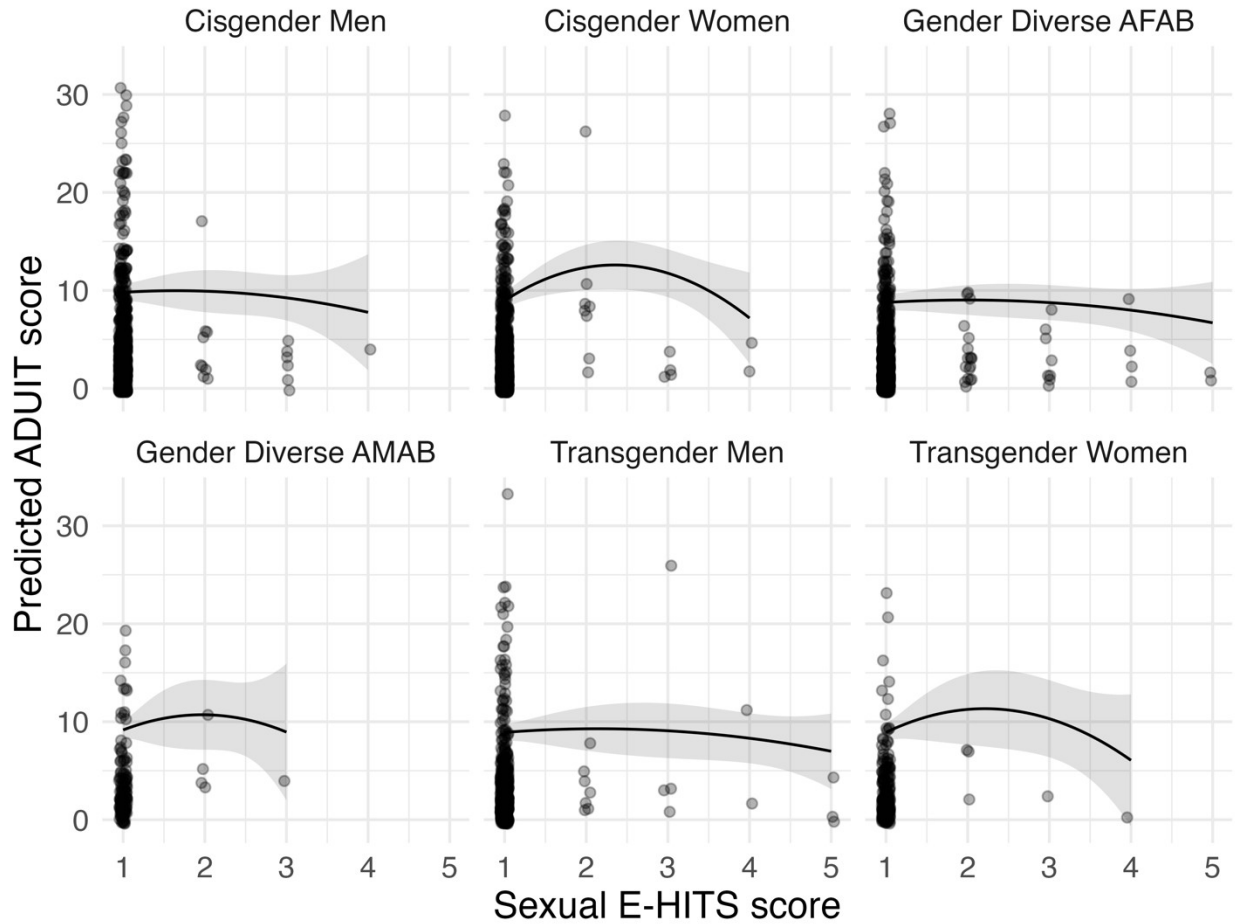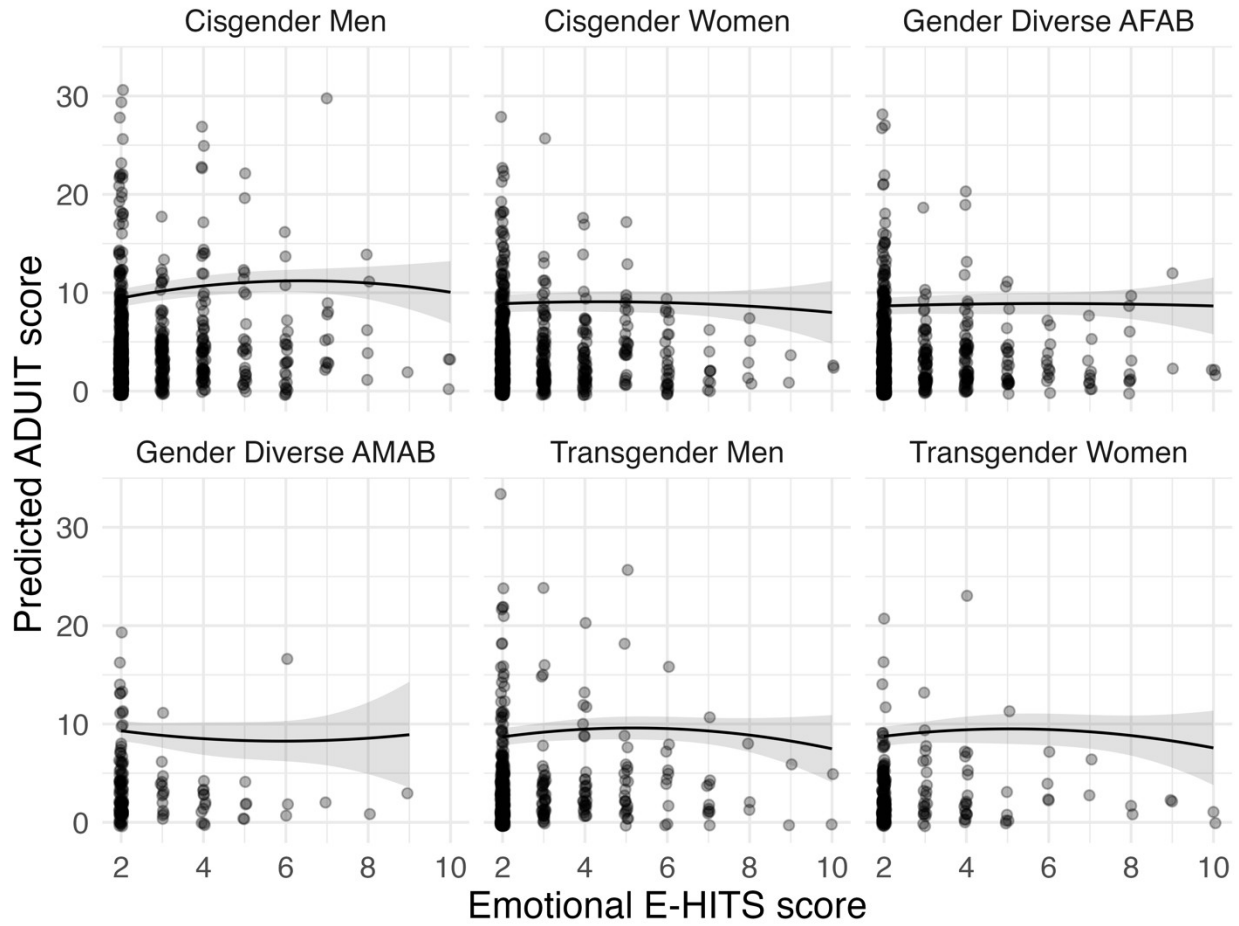
Table 1. Baseline socio-demographic characteristics and history of alcohol use among participants with missing E-HITS or AUDIT items, The PRIDE Study, 2021-2022

	Study Sample Included in Analyses	Excluded Sample with missing E-HITS & AUDIT items
No.	3783	705
Age (years), mean (SD)	39.1 (14.9)	39.6 (15.2)
Gender groups, no (%)		
Cisgender man	929 (24.6)	168 (23.8)
Cisgender woman	998 (26.4)	180 (25.5)
Gender diverse, assigned female at birth	954 (25.2)	152 (21.6)
Gender diverse, assigned male at birth	138 (3.6)	22 (3.1)
Transgender man	541 (14.3)	80 (11.3)
Transgender woman	223 (5.9)	54 (7.7)
Missing	929 (24.6)	49 (7.0)
Sexual orientation groups, no. (%)		
Asexual	110 (2.9)	8 (1.1)
Bisexual	306 (8.1)	50 (7.1)
Gay or Lesbian	1123 (29.7)	227 (32.2)
Pansexual	96 (2.5)	17 (2.4)
Queer	310 (8.2)	69 (9.8)
Heterosexual	35 (0.9)	6 (0.9)
Multiple options selected	1780 (47.1)	322 (45.7)
Endorsed only Another sexual orientation, Same-gender loving, or Questioning	23 (0.6)	6 (0.9)
Ethnoracial identity,[a] no. (%)		
American Indian or Alaska Native	107 (2.8)	21 (3.0)
Asian	173 (4.6)	33 (4.7)
Black, African American or African	138 (3.6)	37 (5.2)
Hispanic, Latino or Spanish	227 (6.0)	56 (7.9)
Middle Eastern or North African	54 (1.4)	12 (1.7)
Native Hawaiian or other Pacific Islander	8 (0.2)	1 (0.1)
White	3478 (91.9)	585 (83.0)
Another	59 (1.6)	7 (1.0)
Education level, no. (%)		
High school or less	142 (3.8)	22 (3.1)
Some college	707 (18.7)	94 (13.3)
4-year college grad	1322 (34.9)	125 (17.7)
Advanced degree	1611 (42.6)	151 (21.4)
Missing	1 (0.0)	313 (44.4)
Employment, no. (%)		
No	1004 (26.5)	104 (14.8)
Yes	2778 (73.4)	300 (42.6)

Missing	1 (0.0)	301 (42.7)
Individual Income, no. (%)		
$0-20,000	1095 (28.9)	117 (16.6)
$20,001-50,000	1109 (29.3)	120 (17.0)
$50,001-100,000	990 (26.2)	95 (13.5)
$100,001+	563 (14.9)	61 (8.7)
Missing	26 (0.7)	312 (44.3)
Region, no. (%)		
Northeast	776 (20.5)	122 (17.3)
Midwest	770 (20.4)	118 (16.7)
South	962 (25.4)	172 (24.4)
West	1253 (33.1)	215 (30.5)
Missing	22 (0.6)	78 (11.1)
Past-year alcohol use, no. (%)		
No	706 (18.7)	77 (10.9)
Yes	3005 (79.4)	357 (50.6)
Missing	72 (1.9)	271 (38.4)
Self-reported alcohol use disorder diagnosis, no. (%)		
No	3647 (96.4)	688 (97.6)
Yes	136 (3.6)	17 (2.4)

[a] Non-mutually exclusive categories.

SD, standard deviation; E-HITS, Extended-Hurt, Insulted, Threaten, Scream; AUDIT, Alcohol Use Disorders Identification Test.

Table 2. Baseline socio-demographic characteristics, intimate partner violence, history of alcohol use, and AUDIT score at 1-year follow-up by current relationship status, The PRIDE Study, 2021-2022

	In a current relationship	
	No	**Yes**
No.	1261	2496
Age (years), mean (SD)	37.96 (15.89)	39.70 (14.30)
Gender groups, no (%)		
Cisgender man	318 (25.2)	605 (24.2)
Cisgender woman	272 (21.6)	720 (28.8)
Gender diverse, assigned female at birth	333 (26.4)	612 (24.5)
Gender diverse, assigned male at birth	52 (4.1)	86 (3.4)
Transgender man	212 (16.8)	324 (13.0)
Transgender woman	74 (5.9)	149 (6.0)
Sexual orientation groups, no. (%)		
Asexual	83 (6.6)	27 (1.1)
Bisexual	99 (7.9)	206 (8.3)
Gay or Lesbian	359 (28.5)	754 (30.2)
Pansexual	27 (2.1)	68 (2.7)
Queer	87 (6.9)	220 (8.8)
Heterosexual	3 (0.2)	31 (1.2)
Multiple options selected	595 (47.2)	1175 (47.1)
Endorsed only Another sexual orientation, Same-gender loving, or Questioning	8 (0.6)	15 (0.6)
Ethnoracial identity,[a] no. (%)		
American Indian or Alaska Native	31 (2.5)	74 (3.0)
Asian	68 (5.4)	102 (4.1)
Black, African American or African	48 (3.8)	90 (3.6)
Hispanic, Latino or Spanish	74 (5.9)	150 (6.0)
Middle Eastern or North African	20 (1.6)	34 (1.4)
Native Hawaiian or other Pacific Islander	3 (0.2)	5 (0.2)
White	1151 (91.3)	2305 (92.3)
Another	20 (1.6)	38 (1.5)
Education level, no. (%)		
High school or less	75 (5.9)	65 (2.6)
Some college	292 (23.2)	407 (16.3)
4-year college grad	469 (37.2)	847 (33.9)
Advanced degree	424 (33.6)	1177 (47.2)
Missing	1 (0.1)	0 (0.0)
Employment, no. (%)		
No	409 (32.4)	586 (23.5)
Yes	852 (67.6)	1909 (76.5)
Missing	0 (0.0)	1 (0.0)
Individual Income, no. (%)		

$0-20,000	487 (38.6)	597 (23.9)
$20,001-50,000	385 (30.5)	717 (28.7)
$50,001-100,000	251 (19.9)	734 (29.4)
$100,001+	128 (10.2)	432 (17.3)
Missing	10 (0.8)	16 (0.6)
Region, no. (%)		
Northeast	255 (20.2)	516 (20.7)
Midwest	245 (19.4)	517 (20.7)
South	344 (27.3)	612 (24.5)
West	403 (32.0)	843 (33.8)
Missing	14 (1.1)	8 (0.3)
Overall E-HITS, mean (SD)	5.45 (1.63)	5.74 (1.52)
Physical E-HITS, mean (SD)	2.07 (0.44)	2.06 (0.37)
Sexual E-HITS, mean (SD)	1.05 (0.32)	1.03 (0.26)
Emotional E-HITS, mean (SD)	2.33 (1.15)	2.65 (1.25)
Past-year alcohol use, no. (%)	913 (72.4)	2084 (83.5)
Self-reported alcohol use disorder diagnosis, no. (%)	54 (4.3)	82 (3.3)
AUDIT, mean (SD)	3.17 (4.03)	3.55 (3.82)

[a] Non-mutually exclusive categories

SD, standard deviation; E-HITS, Extended-Hurt, Insulted, Threaten, Scream; AUDIT, Alcohol Use Disorders Identification Test.

Table 3. Adjusted associations between intimate partner violence and its subtypes with AUDIT scores among participants currently in a relationship, The PRIDE Study, 2021-2022 (n = 2496)

		Adjusted B	**95% CI**	**p-value[a]**
Overall intimate partner violence	E-HITS	0.28	0.12, 0.43	0.012
	E-HITS^2	-0.03	-0.05, -0.01	
Types of intimate partner violence	Physical E-HITS	0.66	-0.14, 1.45	0.161
	Physical E-HITS^2	-0.13	-0.32, 0.05	
	Sexual E-HITS	1.56	0.03, 3.08	0.057
	Sexual E-HITS^2	-0.59	-1.21, 0.02	
	Emotional E-HITS	0.34	0.12, 0.55	0.049
	Emotional E-HITS^2	-0.06	-0.11, 0.00	

Models adjusted for age, gender identity groups, sexual orientation groups, education level, employment, individual income, baseline Census region, past-year alcohol use, baseline self-reported alcohol use disorder diagnosis, and relationship satisfaction. All E-HITS measures were mean centered. AUDIT, Alcohol Use Disorders Identification Test; E-HITS, Extended-Hurt, Insulted, Threaten, Scream; CI, confidence interval.

[a] Compared models with and without quadratic term by pooling the likelihood-ratio test across multiply imputed data sets.

Table 4. Full regression results of interaction terms showing the adjusted associations between intimate partner violence and its subtypes with AUDIT scores across gender groups, The PRIDE Study, 2021-2022 (n = 3783)

	E-HITS		E-HITS²		
	Adjusted B	**95% CI**	*Adjusted B*	**95% CI**	**p-value[a]**
Overall Intimate Partner Violence					
Cisgender Men	0.57	0.28, 0.87	-0.05	-0.09, -0.01	0.010
Cisgender Women	0.21	-0.05, 0.48	-0.03	-0.08, 0.01	0.186
Gender Diverse AFAB	0.10	-0.13, 0.33	-0.02	-0.04, 0.01	0.318
Gender Diverse AMAB	-0.52	-1.40, 0.36	0.08	-0.10, 0.26	0.358
Transgender Men	0.26	-0.04, 0.56	-0.03	-0.05, 0.00	0.068
Transgender Women	0.24	-0.18, 0.65	-0.03	-0.07, 0.02	0.254
Physical Intimate Partner Violence					
Cisgender Men	0.78	-1.02, 2.57	-0.14	-0.63, 0.35	0.565
Cisgender Women	2.28	0.32, 4.24	-0.81	-1.58, -0.04	0.039
Gender Diverse AFAB	0.03	-1.04, 1.11	0.00	-0.23, 0.24	0.986
Gender Diverse AMAB	1.67	-4.39, 7.71	-1.16	-5.90, 3.58	0.629
Transgender Men	0.09	1.25, 1.44	-0.05	-0.28, 0.18	0.673
Transgender Women	0.48	-1.32, 2.29	-0.11	-0.51, 0.27	0.561
Sexual Intimate Partner Violence					
Cisgender Men	0.77	-3.18, 4.71	-0.49	-2.43, 1.45	0.621
Cisgender Women	5.52	2.45, 8.79	-2.15	-3.53, -0.78	0.002
Gender Diverse AFAB	0.32	-1.29, 1.93	-0.24	-0.81, 0.33	0.416
Gender Diverse AMAB	1.54	-6.87, 9.96	-0.59	-6.01, 4.82	0.828
Transgender Men	1.82	-0.86, 4.51	-0.63	-1.44, 0.19	0.301
Transgender Women	4.31	-0.47, 9.08	-1.77	-3.75, 0.21	0.199
Emotional Intimate Partner Violence					
Cisgender Men	0.75	0.34, 1.16	-0.11	-0.21, 0.00	0.042
Cisgender Women	0.23	-0.12, 0.58	-0.06	-0.15, 0.03	0.210
Gender Diverse AFAB	0.06	-0.28, 0.41	-0.01	-0.09, 0.07	0.774
Gender Diverse AMAB	-0.69	-1.72, 0.35	0.11	-0.15, 0.37	0.383
Transgender Men	0.56	0.05, 1.07	-0.12	-0.24, 0.00	0.042
Transgender Women	0.50	-0.10, 1.10	-0.10	-0.22, 0.01	0.094

Models further adjusted for age, sexual orientation groups, education level, employment, individual income, Census region, past-year alcohol use, and self-reported alcohol use disorder diagnosis. All E-HITS measures were mean centered. AUDIT, Alcohol Use Disorders Identification Test; E-HITS, Extended-Hurt, Insulted, Threaten, Scream; CI, confidence interval; AFAB, assigned female at birth; AMAB, assigned male at birth.
[a] Compared models with and without quadratic term by pooling the likelihood-ratio test across multiply imputed data sets.