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Alcohol Use and Alcohol-related Consequences Based on Gender and Sexual Orientation among College Students

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Abstract

Background and Objectives: Research has not yet investigated how the association between alcohol and alcohol-related consequences differs across cisgender heterosexual women (CHW), cisgender heterosexual men (CHM), and sexual and gender minority (SGM) college students.

Methods: Participants were 754 college students (34.5% CHW; 34.5% CHM; 31.0% SGM) between the ages 18 and 25 who completed a survey on sexual orientation, gender identity, alcohol use (i.e., average drinks per week), and alcohol-related consequences.

Results: Among individuals who reported alcohol use, CHM reported significantly more drinks per week compared to CHW and SGM. The logistic model of a zero-inflated negative binomial regression indicated that excess zeros in the alcohol-related consequences were more likely among 1) non-drinkers and 2) SGM compared to CHM. The count portion of the model indicated that, among drinkers, there was a positive association between drinks per week and alcohol-related consequences. Estimated alcohol-related consequences per drink were 1.90% higher among

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CHW than CHM and 2.76% higher among SGM than CHM. Exploratory analyses did not find significant differences in outcomes between cisgender female and male sexual minority students.

Discussion and Conclusion: Findings suggest that although CHW and SGM students consume less alcohol than CHM, these students experience more alcohol-related consequences per drink.

Scientific Significance: This study advances the field's knowledge of alcohol use patterns and consequences among SGM college students. There is a need for alcohol education programing that is tailored to the unique experiences, identities, and minority stressors of SGM college students.

1. INTRODUCTION

Alcohol use is a serious problem at college campuses across the United States. Roughly 58% of U.S. college students drink alcohol,[1] and about 20% of college students meet the criteria for alcohol use disorder (AUD).[2] Sexual and gender minority (SGM) college students have reported higher levels of alcohol use compared to their cisgender heterosexual (CH) counterparts.[3] Sexual minority individuals include, but are not limited to, those who identify as lesbian, gay, bisexual, asexual, Two-Spirit, and/or queer, while gender minority individuals include those who identify as transgender, Two-Spirit, genderqueer, non-binary, and/or intersex.[4,5] SGM groups have high prevalence of alcohol misuse, but research examining SGM individuals' alcohol use is scarce.[6] In addition, SGM are recognized as priority populations for prevention of AUD,[7] and alcohol use may exacerbate negative health outcomes among SGM college students.

1.2 Negative Health Outcomes among Sexual and Gender Minorities

SGM individuals experience systematic oppression, discrimination, and stigma related to their sexuality and/or gender, which often leads to elevated levels of stress and adverse physical and mental health outcomes.[8–10] Consistent with the minority stress model, SGM experience proximal and distal stressors, such as stigma, discrimination, and violence, that are related to hazardous alcohol use and AUD,[11–16] which in turn manifest as poor physical and mental health outcomes.[17,18] Some evidence also suggests that minority populations have higher cortisol levels compared to non-minority groups, demonstrating chronic daily stress.[18,19] The link between experiences of stress and alcohol use can be attributed to the activation of pathways and brain centers related to rewards,[20,21] which involves direct experiences of stress as well as the anticipation of adverse stimuli.[22] Thus, these neurological processes correspond directly with both proximal and distal stressors in the minority stress model that may cause SGM populations to establish maladaptive coping mechanisms like alcohol use. Thus, SGM college students may carry a high burden of stress related to their identity and may be at increased risk of experiencing negative alcohol-related consequences compared to their CH peers.

1.1 Negative Alcohol-Related Consequences

College students who engage in alcohol use often experience a host of negative health and social consequences.[23–25] Some studies suggest that there may be differences in alcohol-related consequences among cisgender men and women; women are more likely than men to

experience depression and psychological distress as alcohol-related consequences,[26,27] while men are more likely to experience strains in relationships and engage in behaviors they later regretted.[28] However, there is a dearth of literature on the differences in alcohol-related consequences among cisgender heterosexual women (CHW), cisgender heterosexual men (CHM), and SGM college students.

A study of 422,906 college students found that, in a fourteen-day period, transgender college students were more likely to drink alcohol, consume more alcoholic drinks, and drink more total drinks per day compared to cisgender college students.[29] In addition, gender minority college students experienced higher rates of alcohol-related blackouts and negative alcohol-related sexual consequences compared to cisgender college students.[29] Among 2,497 college students, sexual minority college students engaged in higher alcohol use and problem drinking compared to heterosexual college students.[10] Among college-aged sexual minority women, exposure to minority stressors has been associated with experiencing negative alcohol consequences, and is longitudinally linked to experiencing alcohol consequences.[30] However, this study did not compare alcohol consequences to CH peers. Because alcohol use among SGM college students remains a serious problem, it is important to understand the burden of alcohol-related consequences among SGM college students compared to their CH peers.

1.3 Study Purpose

The purpose of this study is to understand how the association between alcohol consumption and alcohol-related consequences differs between CHW, CHM, and SGM college students. The study hypotheses are as follows:

Hypothesis 1: Greater alcohol use will correspond to higher reported alcohol-related consequences, regardless of identity group.

Hypothesis 2: Significant group differences in alcohol-related consequences will exist, such that SGM will experience the most alcohol-related consequences and CHM will experience the fewest.

Hypothesis 3: The association between alcohol use and reported alcohol-related consequences will differ based on group membership, such that SGM will have the most alcohol-related consequences per drink and CHM have the least, on average.

2. METHODS

2.1. Participants

A random sample of participants was recruited to participate in this study, which involved completing a survey to assess campus-based norms related to alcohol use and sexual violence. Participants in this sample were 754 college students ages 18 to 25, and were full-time, on-campus students at a large, public university in the Southwest region of the United States. Recruitment was capped at 250 per subgroup to capture similar numbers of participants per subgroup, resulting in a sample of 34.5% CHW (n=260), 34.5% CHM (n=260), and 31.0% SGM (n=234).[1,5]

2.2. Procedure

Participants were recruited using a random sample of students' email addresses provided by the University's registrar. Students in the sampling frame were sent an email to participate in a study assessing alcohol use and sexual behaviors and, if interested, completed a brief screening survey. Participants were eligible if they were a full-time student, living on or near campus, and were between the ages of 18 and 25. Participants completed an electronic consent form, then completed an online survey which took about 30 minutes to complete. Participants were compensated with a $15 eGift card. All study procedures were reviewed and approved by the University's Institutional Review Board.

2.3. Measures

2.3.1. Demographics.—Participants completed a variety of demographic items which assessed age, race/ethnicity, living situation, and sorority or fraternity membership; see Table 1.

2.3.2. Gender and Sexual Orientation.—To assess gender, participants were asked: "Understanding gender identity can be complex, which one category best describes your gender identity now?"[31] Response options were: female; male; transgender (female-to-male (FTM)); transgender (male-to-female (MTF)); and other. To assess sexual orientation, participants were asked: "Understanding that sexual identity can be complex, which one category best describes your sexual identity now?"[32] Response options were: lesbian; gay; bisexual; queer; two-spirit; straight/heterosexual; questioning; and other. Participants were categorized as CHM if they identified as male and straight, CHW if they identified as female and straight, and as SGM if they identified that their gender was transgender or other or if their sexual orientation was any response other than straight. An additional identity question was asked in the eligibility screener for 231 participants: "If you HAD to choose one of the following, which of the following best represents you?" with options corresponding to CHM, CHW, and SGM. This question was used to categorize three CHM with missing demographic data. Four individuals who responded "Prefer not to answer" for sexual orientation and did not receive the additional identity question due to survey skip logic were excluded from the sample.

2.3.3. Alcohol Use.—To assess total drinks consumed per week, the Daily Drinking Questionnaire (DDQ) was used.[33] Participants were queried on how many standard drinks, on average, they typically consume each day of the week. A standard drink in the United States is any drink that contains about 14 grams of pure alcohol (about 0.6 fluid ounces or 1.2 tablespoons), such as one 12 oz. beer, one 5 oz. glass of wine, or one 1.5 oz. shot of liquor. This definition of a standard drink was included in the measure instructions. Total drinks per week were calculated by summing the number of drinks consumed on each average day. The DDQ is a commonly-used measure of alcohol use among college students, and prior research has demonstrated its validity and reliability among this population.[34]

[1]Due to a technical error, two groups exceeded their caps by 10 participants each.

2.3.4. Alcohol-Related Consequences.—To assess alcohol-related consequences, the Brief Young Adult Alcohol Consequences Questionnaire (BYAACQ) was utilized.[35] The BYAACQ contains 24-items, with dichotomous (yes/no) response options, to assess for past-year alcohol-related consequences. An example item includes, "I have taken foolish risks while I have been drinking." The count of yes responses was recorded for each participant. Prior research has evidenced the BYAACQ to demonstrate adequate reliability and validity among college students.[36]

2.4. Data Analysis

Data was analyzed using R, with the pscl package used for estimating zero-inflated negative binomial models,[37,38] the boot package used for bootstrapped confidence intervals,[39] and ggplot2 used for visualization.[40] Given the substantial proportion of individuals who reported zero drinks during a typical week (48.81% of respondents report zero drinks per week) and the assumed relationship between reporting zero drinks and reporting zero consequences, the count of weekly drinks was treated as a zero-inflated process. That is, this variable reflects both the decision to drink or not, as well as the number of weekly drinks for those who report regular drinking.

In order to account for the substantial number of zero-consequence responses and skew of the reported counts, a zero-inflated negative binomial model was used to model alcohol-related consequences. The zero-inflated negative binomial model allows for estimation of predictors for the probability of reporting zero consequences in excess of the typical amount of zeros in a negative binomial distribution (the logistic portion of the model), as well as predictors of the count of consequences assuming a negative binomial distribution. The logistic portion of the model includes a binary indicator for zero reported drinks and group membership (i.e., CHW, CHM, and SGM) as predictors of whether students report zero alcohol-related consequences. The count of self-reported drinks per week, group membership (i.e. CHW, CHM, and SGM), and the interaction between number of drinks and group membership are included in the count portion of the negative binomial model to study how the relationship between drinking and consequences differs across groups. Due to the logistic link functions used in the model-fitting procedure, we exponentiate coefficients to produce the incidence risk ratios (IRRs) for the count portion of the model and odds ratios (ORs) for the logistic portion. A Vuong test comparing the zero-inflated negative binomial model to a negative binomial model supports the inclusion of the logistic portion of the model ($p < .001$).[41] Summary statistics of counts and percentages for all variables included in the analysis are provided in Table 1, where percentages are out of sexual and gender identity group totals.

3. RESULTS

3.1. Sample Demographics

Table 1 presents the sample characteristics. On average, participants within this sample reported a mean age of 19.0 years of age. Data on race and ethnicity was not captured among 31.8% of participants due to a survey platform malfunction ($n = 240$). The majority of remaining college students in the sample were White (43.0%) and 50.9% were

not Hispanic or Latinx. Table 2 presents sample characteristics within the SGM group. Participants in this group largely identified as cisgender female (hereafter called cisfemale) (71.4%). and bisexual (51.3%).

3.2. Descriptive Results

3.2.1. Alcohol Use.—In regards to total drinking behaviors, participants across all risk groups reported drinking an average of 4.4 drinks per week (SD = 7.7). The shape of the distribution of number of drinks per week is consistent across the sexual and gender identity groups, with a substantial number of 0 responses and right skew indicating that few individuals consume extreme numbers of weekly drinks. There was not a significant difference in the proportion of individuals who drink across the sexual and gender identity groups ($X^2(2) = 1.49$, $p = .47$): 54.2% of CHW, 49.2% of CHM, and 50.0% of SGM reported regular drinking in a typical week, nor was there a difference within SGM in the proportion of individuals who drink based on gender identity comparing cisfemale sexual minority (CFSM; $n = 84$, 50.30%) and cisgender male (hereafter called cismale) sexual minority (CMSM; $n = 29$, 54.72%, $X^2(1) = 0.16$, $p = 0.69$) or sexual identities – bisexual ($n = 64$, 53.33%), gay/lesbian (n=18, 41.86%), and non-heterosexual others (e.g., those who identified as queer, questioning, Two-Spirit, other, or preferred not to answer) (n=35, 50.00%, $X^2(2) = 1.67$, $p = 0.43$). Among those who reported drinking during a typical week, CHM reported drinking a significantly higher average number of drinks per week ($M = 10.82$) compared to CHW ($M = 7.85$, $t = 2.77$, $p = .006$) and SGM ($M = 7.09$, $t = 3.33$, $p < .001$), though SGM and CHW do not significantly differ from one another. Within the SGM group, there were not significant differences in the number of drinks consumed between CMSM ($M = 6.66$) and CFSM ($M = 7.06$, $t = 0.314$, $p = 0.75$) or sexual identities – bisexual ($M = 7.57$), gay/lesbian ($M = 7.28$), and non-heterosexual others ($M = 6.10$, F(2,114) = 0.70, $p = 0.50$) who drink.

3.2.2. Alcohol Consequences.—Respondents experienced an average of 4.4 occurrences of yearly alcohol-related consequences (SD = 4.8), as assessed by the BYAACQ.[35] Similar to alcohol consumption, alcohol-related consequences as measured by the BYAACQ had a large portion of zero-valued responses and were right-skewed. CHW reported the highest number of alcohol-related consequences ($M = 4.66$) followed by SGM ($M = 4.43$) and CHM ($M = 4.00$), but these means did not differ significantly ($F(2,750) = 1.27$, $p = .28$). This pattern holds after separating the sexual and gender identity groups by drinking behavior and examining only students who reported drinking regularly. Figure 1 shows that the disproportionate number of zero-valued responses in BYAACQ were largely attributable to those students who do not drink regularly. However, many students who did not report drinking regularly still report alcohol-related consequences. Within SGM, there were not significant differences in alcohol-related consequences between CMSM ($M = 4.21$) and CFSM ($M = 4.51$, $t = 0.43$, $p = 0.67$) or sexual identities – bisexual ($M = 4.87$), gay/lesbian ($M = 4.30$), and non-heterosexual others ($M = 3.83$, F(2,230) = 1.18, $p = 0.31$) for those who drink.

3.3. Test of Hypotheses on the Association between Alcohol Use and Alcohol Consequences

The results of our statistical model are summarized in Table 3. We found that, after accounting for excess zeros in consequences by predicting with binary nondrinker status and group membership (i.e., CHW, CHM, and SGM) in the zero-inflated negative binomial model, the number of weekly drinks was positively associated with alcohol-related consequences. Further, this relation between number of drinks and number of consequences was moderated by group membership. For each additional drink reported per week, estimated alcohol-related consequences increased by 3.37% (95% CI: 2.31% - 4.44%) for CHM conditional on reporting nonzero consequences. Compared to CHM, estimated consequences per drink were an additional 2.76% higher (95% CI: 0.66% - 4.90%, for an average estimated increase in consequences of 6.22% per drink) for SGM and an additional 1.90% higher (95% CI: 0.11% – 3.73%, for an average estimated increase in consequences of 5.34% per drink) for CHW who report nonzero consequences. SGM and CHW did not significantly differ in estimated consequences per drink.

The logistic portion of the model revealed that individuals who reported zero weekly drinks were an estimated 76.61 times more likely to correspond to an excess zero (relative to a negative binomial distribution) in the reported alcohol-related consequences. Additionally, SGM were less likely than CHM to report an excess zero alcohol-related consequences. There were not significant differences in the odds of reporting an excess zero consequences between CHW and SGM college students, or CHW and CHM. Results of this analysis did not change when removing non-cisgender gender minority students (n=14; see Table 2 “other gender identity” category) from the SGM group.

Figure 2 shows the alcohol-related consequences based on the number of weekly drinks for each sexual and gender identity group, as estimated by the model in Table 3. Consequences for zero weekly drinks were estimated by setting the binary indicator for drinking to false and the number of weekly drinks to 0. Consequences for 1 or more weekly drinks were estimated by setting the binary indicator for drinking to true.

Follow-up analyses further divided the SGM group into cismale sexual minority (CMSM; $n = 53$) and cisfemale sexual minority (CFSM; $n = 167$) students, dropping 14 students who did not report cisgender identity. Differences between CHM and cisfemales persisted, with estimated consequences per drink 2.51% higher (95% CI: 0.21% - 4.86%) for CFSM than CHM. CMSM exhibit a similar pattern to CFSM with 2.42% higher consequences per drink than CHM on average, but do not significantly differ from CHM in our sample (95% CI: −1.95% - 6.98%). Estimated alcohol-related consequences for CMSM and CFSM are included in Figure 2. Similarly, when treating gender and sexuality as separate factors in the zero-inflated negative binomial model, there is not a significant difference in consequences per drink between sexual minority and heterosexual participants (sexual minorities 1.07% higher, 95% CI: −1.08% - 3.27%) while controlling for gender differences in consequences per drink (cisfemales 1.73% higher, 95% CI: 0.07% - 3.42%).

3.4. Sensitivity Analyses

Sensitivity analyses found that additional demographic variables of age, race, ethnicity, living situation, and fraternity or sorority membership were not significantly related to alcohol-related consequences. Controlling for these variables did not change the overall finding that the association between drinks per week and alcohol-related consequences differs by sexual and gender identity group membership. The model presented in Table 3 contains only the listed variables concerning group membership and drinking behavior as factors associated with alcohol-related consequences.

4. DISCUSSION

While alcohol use among college students has been documented as a pervasive problem, alcohol-related disparities among SGM are not well understood. The current study investigated differences in levels of college drinking, alcohol-related consequences, and the association between drinking and alcohol-related consequences among CHM, CHW, and SGM college students. Results show that roughly 50% of college students in each group reported alcohol use. However, the quantity of drinks and the associated consequences differ across these groups. Further, we found persistent gender effects suggesting that gender may be the primary driver of differences in our sample.

First, we set out to understand the differences in alcohol use and alcohol-related consequences between CHW, CHM, and SGM college students. Findings from this stage suggest that SGM and CHW differ from CHM in their experiences of alcohol-related consequences per drink. These findings are consistent with the literature indicating that alcohol-related consequences are more severe among college CHW than CHM,[27,28] even though alcohol use is higher among CHM than CHW.[25] While other studies have shown that alcohol use is higher among SGM individuals compared to CH individuals,[3,29] this study found that CHM drank more alcohol than both SGM and CHW. One possible explanation for these findings is that SGM individuals may stop drinking earlier during a night out because they experience alcohol-related consequences, though this study did not collect event-level data to capture alcohol use patterns over several hours. Future research on alcohol use and consequences should incorporate ecological momentary assessments to understand more nuanced information on alcohol use patterns among SGM college students.

Differences between the current findings and previous research regarding consumption rates may also be due to discrepancies in how alcohol use is measured across various studies. In a 2016 systematic review, the authors note the variety of alcohol use measures used to assess alcohol use among SGM.[3] This study used an assessment of weekly drinks consumed in order to examine alcohol-related consequences based on each drink consumed, which was selected to understand alcohol-related consequences across a wider range of drinking behaviors. However, the discrepancy in how alcohol use is measured may also explain the number of study respondents who report alcohol-related consequences while also reporting zero weekly drinks. There is, therefore, a need for standardization of alcohol-related measures to better understand alcohol use among SGM.[3]

Study findings indicate that SGM college students experienced more alcohol-related consequences than CHM, but not CHW, despite reporting less alcohol use. As the minority stress model purports, experiencing stress tied to minority status and identity comes with discrimination and microaggressions, which often manifest in adverse physical health and mental health problems.[17,18] Therefore, the distal stressors SGM experience related to their minority status and identity[17] may explain why findings indicate SGM college students are more likely to experience alcohol-related consequences even when engaging in less alcohol use than CHM. While study findings align with prior research indicating that SGM college students experience more alcohol-related consequences than men,[29] this study adds new knowledge that SGM experience more alcohol-related consequences than CHM even when they drink less. However, more research is needed to determine how experiences of minority stress are related to negative alcohol-related consequences. To alleviate stress related to minority status among SGM students, universities should provide resources specifically designed to support SGM students on campus, including mental health services with providers who have experience working with SGM, SGM-specific free legal services, and services to help students who are transitioning and may be on or beginning hormone therapy. Because the issues that SGM experience stem from both external and internalized discrimination and stigma, providing resources to SGM may indirectly reduce negative alcohol-related consequences.

Our initial findings may also be due to the fact that the SGM group was primarily comprised of cisgender females. Previous studies have indicated that there may be differences in alcohol use among SGM,[10,29] though men and women within our study's SGM group did not significantly differ in their alcohol use. We conducted exploratory analyses to better understand the complexities of the experience of SGM by examining alcohol consumption and alcohol-related consequences by gender and sexuality separately. These exploratory analyses suggested that CFSM may exhibit similar drinking patterns as CHW, and that the average association between drinks and consequences was similar for both CFSM and CMSM. While our initial findings suggest differences in consequences associated with alcohol use for CHW and SGM compared to CHM, follow-up analyses suggest that gender identity may be the main differentiator of the association between alcohol consumption and alcohol-related consequences in this sample. This is not surprising, given that the SGM group is comprised of 70% cisgender females, though there may be differences between heterosexual and sexual minority students or cisgender and gender minority students that are smaller than our study was powered to capture. Previous research suggests that CFSM who experience minority stressors experience long-term alcohol consequences.[30] However, to our knowledge, this is the first study that examined experiences of alcohol-related consequences among CFSM compared to their CH peers. Though this study was not initially designed to examine gender and sexuality separately, these findings provide insight on the diverse experiences within SGM that future research should further explore. Thus, these findings suggest the need for further research on alcohol use and alcohol-related consequences among sexual minority college students.

It is also worth noting the sexual and gender identities of students within the SGM group in our sample. The SGM college students in the study sample included a high proportion of females (71%) and bisexual (51%) college students, but included a very small proportion

of gender minority college students (6% of SGM, or 1.9% of the sample) compared to the national estimate (1.7–4.5%).[45,46] The proportion of bisexual individuals among SGM in this study is similar to that of bisexual individuals in the U.S.[42] While the proportion of females in our sample is also similar to samples of SGM college students in recent studies,[43,44] the small proportion of gender minority college students indicates the need to incorporate more targeted recruitment strategies to include more gender minority students. In addition, to capture experiences unique to gender minority students, studies should specifically study gender minority college students.

Study findings have implications for future research and programming to prevent alcohol-related consequences among college students of diverse sexual and gender identities. SGM and CHW experience more alcohol-related consequences per drink compared to CHM even though they consume less alcohol than CHM, suggesting a need for programs that focus on alcohol use and prevention of alcohol-related consequences that are tailored to meet the specific needs and experiences of SGM. Some sexual violence prevention programs for college women already incorporate strategies to reduce alcohol use and alcohol-related consequences related to sexual violence,[47,48] though there is a need for programs that also focus on a wider array of alcohol-related consequences that can affect college women. In addition, to our knowledge, there are no existing alcohol programs developed for SGM college students and which take into account the range of minority stressors and experiences of SGM individuals. Our findings indicate that there is not a one-size-fits-all approach to developing alcohol programming that meets the needs of both sexual and gender minority college students. As such, more research is needed to understand the unique experiences of alcohol-related consequences among sexual and gender minority college students.

4.1. Limitations

The current study makes important contributions to the scientific understanding of sexual and gender disparities in alcohol use and subsequent social and health consequences. Results come from a random sample of college students with high representation of SGM. However, the SGM group in the sample is comprised of 70% cisgender females, thus the SGM sample may not capture the full range of experiences among sexual and gender minority college students. Research also may not proportionally reflect the heterogeneity among subtypes of SGM and the sample is not nationally-representative. Further, due to a survey malfunction, data on race and ethnicity is missing for roughly 30% of the sample. Additionally, the measure of alcohol-related consequences assessed consequences experienced in the past 12 months, but the measure of alcohol use assessed *current* alcohol use. The survey question on sexual identity included “Two-Spirit” as a response option though Two-Spirit is considered a gender or sexual identity. However, this response option was not mutually exclusive and applied to only two individuals who reported identifying as gender minority. Nevertheless, this was a novel investigation that revealed disparities for SGM and CHW in alcohol-related consequences.

4.2. Conclusions

This study found that SGM college students experience more alcohol-related consequences than CHM even when they drink less alcohol, thus this research makes a significant

contribution to the existing literature on SGM college students and alcohol use. It is important to support SGM college students with the stress, discrimination, and microaggressions they experience as a minority[19] and to minimize their chances of developing maladaptive coping mechanisms, such as HED, that can increase the likelihood of experiencing alcohol-related consequences.[11,49] To alleviate this stress, there is a need for more targeted integrated alcohol interventions as well as structural interventions (e.g., mental health services, SGM-specific legal services, and student health services to support students who may be transitioning) at U.S. colleges and universities. Campus-based programs and efforts to reduce discrimination and stigma against SGM can lead to more long-term positive health outcomes for SGM college students and may reduce their likelihood of developing unhealthy drinking patterns.

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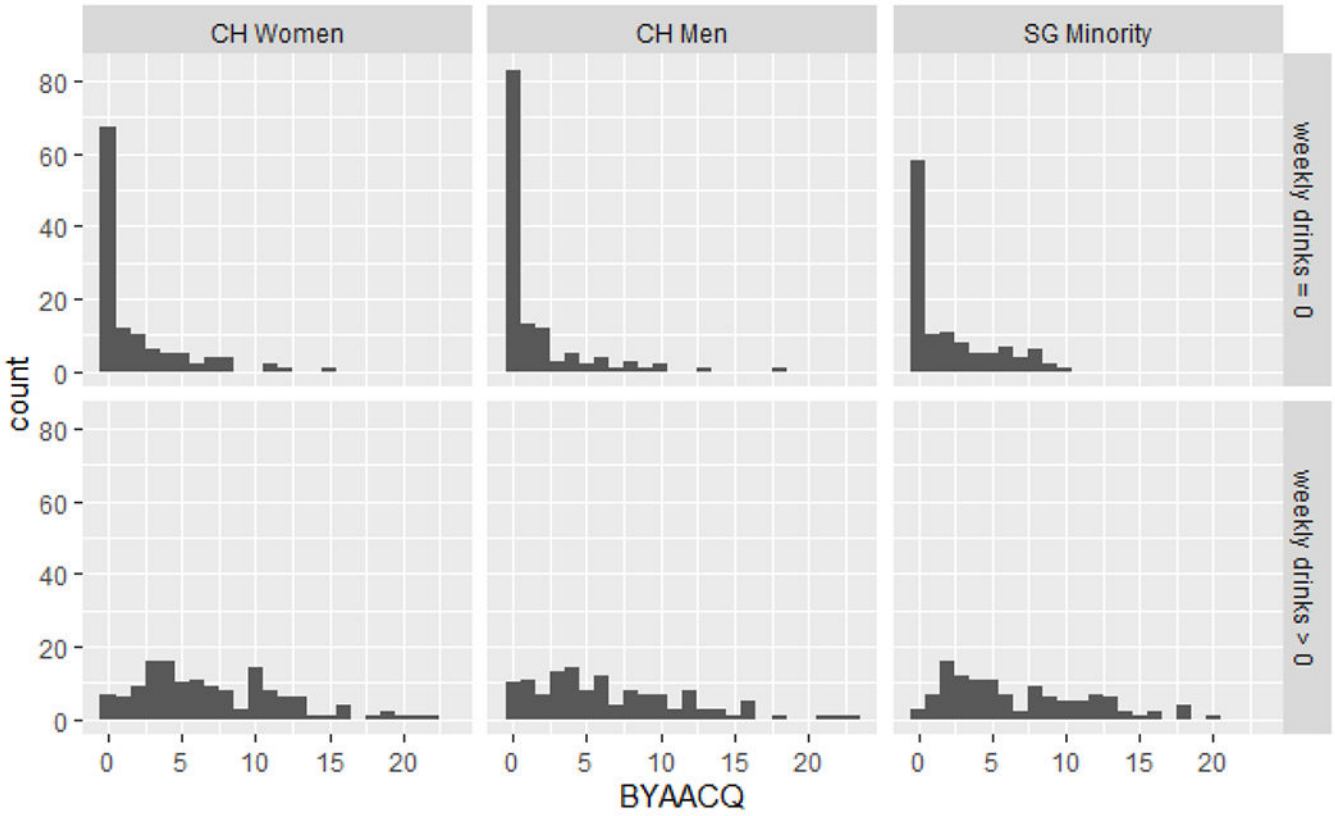

Figure 1:
Alcohol-Related Consequences

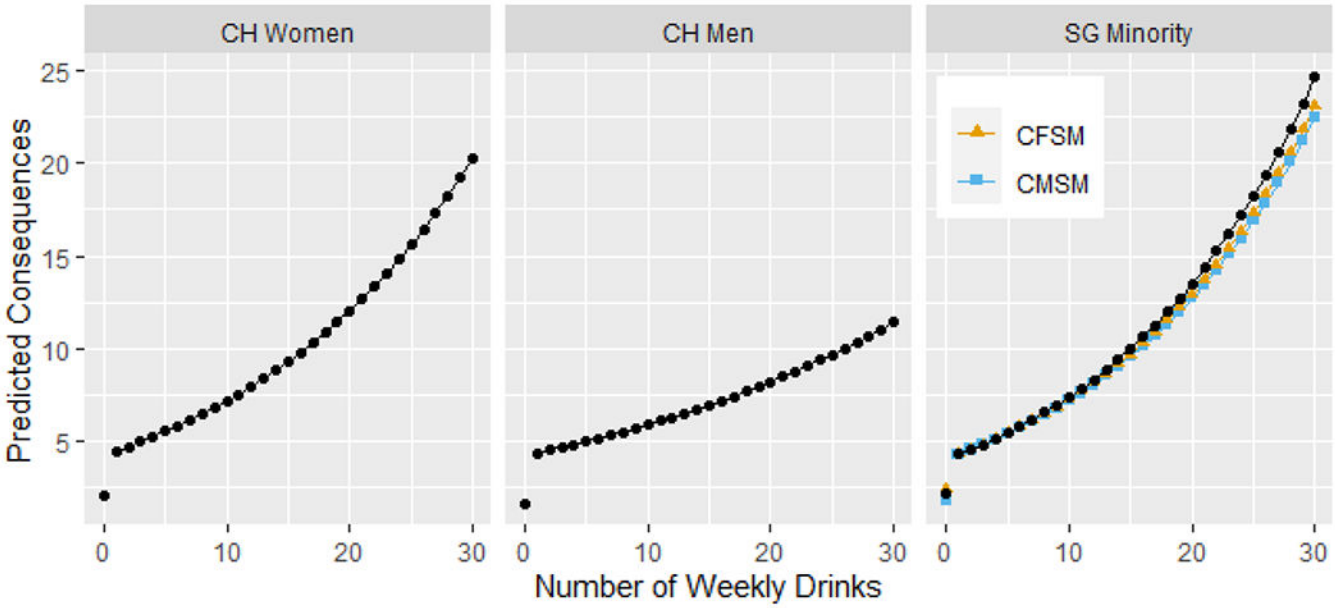

Figure 2:
Predicted Alcohol-Related Consequences

Table 1:

Sample Demographics

	CHW (N=260)	CHM (N=260)	SGM (N=234)	Overall (N=754)
Age				
Mean (SD)	19 (1.0)	19 (1.1)	19 (1.1)	19 (1.1)
Missing	0 (0%)	3 (1.2%)	0 (0%)	3 (0.4%)
Drinks per Week				
Mean (SD)	4.3 (6.6)	5.3 (10)	3.5 (5.5)	4.4 (7.7)
Regular Drinking				
Does Not Drink Regularly	119 (45.8%)	132 (50.8%)	117 (50.0%)	368 (48.8%)
Drinks Regularly	141 (54.2%)	128 (49.2%)	117 (50.0%)	386 (51.2%)
Drinks per Week Among Those Who Drink				
Mean (SD)	7.9 (7.3)	11 (12)	7.1 (5.9)	8.6 (8.9)
Count of BYAACQ Consequences				
Mean (SD)	4.7 (4.9)	4.0 (4.9)	4.4 (4.5)	4.4 (4.8)
Missing	0 (0%)	1 (0.4%)	0 (0%)	1 (0.1%)
Consequences Among Those Who Drink				
Mean (SD)	7.1 (4.9)	6.6 (5.1)	6.8 (4.8)	6.8 (4.9)
Race				
Black/African American	7 (2.7%)	12 (4.6%)	13 (5.6%)	32 (4.2%)
White	119 (45.8%)	93 (35.8%)	112 (47.9%)	324 (43.0%)
Native American	3 (1.2%)	4 (1.5%)	6 (2.6%)	13 (1.7%)
Asian/Pacific Islander	19 (7.3%)	37 (14.2%)	18 (7.7%)	74 (9.8%)
Multiracial	27 (10.4%)	19 (7.3%)	24 (10.3%)	70 (9.3%)
Other	0 (0%)	0 (0%)	1 (0.4%)	1 (0.1%)
Missing	85 (32.7%)	95 (36.5%)	60 (25.6%)	240 (31.8%)
Ethnicity				
Hispanic/Latinx	47 (18.1%)	34 (13.1%)	49 (20.9%)	130 (17.2%)
Non-Hispanic/Non-Latinx	128 (49.2%)	131 (50.4%)	125 (53.4%)	384 (50.9%)
Missing	85 (32.7%)	95 (36.5%)	60 (25.6%)	240 (31.8%)
Living Situation				
Fraternity/Sorority House	8 (3.1%)	10 (3.8%)	2 (0.9%)	20 (2.7%)
Off-Campus Housing/Apartment/House	12 (4.6%)	15 (5.8%)	25 (10.7%)	52 (6.9%)
Residence Halls/Dorm Rooms	238 (91.5%)	229 (88.1%)	207 (88.5%)	674 (89.4%)
With Parents	2 (0.8%)	3 (1.2%)	0 (0%)	5(0.7%)
Missing	0 (0%)	3 (1.2%)	0 (0%)	3 (0.4%)
Membership in Greek-letter Organization				
No	217 (83.5%)	223 (85.8%)	213 (91.0%)	653 (86.6%)
Yes	43 (16.5%)	34 (13.1%)	21 (9.0%)	98 (13.0%)
Missing	0 (0%)	3 (1.2%)	0 (0%)	3 (0.4%)

Table 2:

Sample Demographics for SGM, Separated by Gender Identity

	CFSM (N=167)	CMSM (N=53)	Other Gender Identity (N=14)	Overall SGM (N=234)
Drinks per Week				
Mean (SD)	3.6 (5.7)	3.6 (5.0)	3.1 (5.6)	3.5 (5.5)
Whether Person Reports Regular Drinking				
Does Not Drink Regularly	83 (49.7%)	24 (45.3%)	10 (71.4%)	117 (50.0%)
Drinks Regularly	84 (50.3%)	29 (54.7%)	4 (28.6%)	117 (50.0%)
Drinks per Week Among Those Who Drink				
Mean (SD)	7.1 (6.2)	6.7 (5.1)	11 (4.9)	7.1 (5.9)
Count of BYAACQ Consequences				
Mean (SD)	4.5 (4.5)	4.2 (4.5)	4.3 (5.6)	4.4 (4.5)
Count of BYAACQ Consequences Among Those Who Drink				
Mean (SD)	6.7 (4.8)	6.2 (4.7)	12 (3.3)	6.8 (4.8)
Sexuality				
Bisexual	96 (57.5%)	21 (39.6%)	3 (21.4%)	120 (51.3%)
Gay	2 (1.2%)	17 (32.1%)	1 (7.1%)	20 (8.5%)
Lesbian	19 (11.4%)	0 (0%)	4 (28.6%)	23 (9.8%)
Queer	17 (10.2%)	2 (3.8%)	0 (0%)	19 (8.1%)
Questioning	19 (11.4%)	7 (13.2%)	1 (7.1%)	27 (11.5%)
Straight/Heterosexual	0 (0%)	0 (0%)	1 (7.1%)	1 (0.4%)
Two-Spirit	0 (0%)	0 (0%)	2 (14.3%)	2 (0.9%)
Other	12 (7.2%)	5 (9.4%)	2 (14.3%)	19 (8.1%)
Prefer not to answer	2 (1.2%)	1 (1.9%)	0 (0%)	3 (1.3%)

Table 3:

Model Summary

	Dependent variable: BYAACQ Count			
	IRR/OR	**B**	**SE B**	**Z**
Count Portion of Model				
Constant	4.319	1.463	0.073	20.127 ***
SGM (vs CH Men)	0.945	−0.056	0.103	−0.549
CH Women (vs CH Men)	1.001	0.001	0.100	0.006
Weekly Drinks	1.034	0.033	0.005	6.319 ***
SGM: Weekly Drinks	1.028	0.027	0.011	2.588 ***
CHW: Weekly Drinks	1.019	0.019	0.009	2.079 **
Logistic Portion of Model (for predicting excess zeros)				
Constant	0.021	−3.860	0.740	−5.220 ***
Zero Weekly Drinks	76.607	4.339	0.723	6.001 ***
SGM (vs CH Men)	0.508	−0.677	0.274	−2.470 **
CH Women (vs CH Men)	0.701	−0.355	0.270	−1.316
Observations		753		
Log Likelihood		−1,687.92		

Note:

* $p < 0.1$

** $p < 0.05$

*** $p < 0.01$