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Risk Factors for Alcohol Use, Frequent Use, and Binge Drinking among Young Men Who Have Sex with Men

Carolyn F. Wong, PhD,
Community, Health Outcomes, and Intervention Research Program, The Saban Research Institute, Childrens Hospital Los Angeles, 4650 Sunset Blvd, MS#30, Los Angeles, CA 90027, Department of Pediatrics, Childrens Hospital Los Angeles & Keck School of Medicine, University of Southern California, cawong@chla.usc.edu

Michele D. Kipke, PhD, and
Community, Health Outcomes, and Intervention Research Program, The Saban Research Institute, Childrens Hospital Los Angeles, 4650 Sunset Blvd, MS#30, Los Angeles, CA 90027, Department of Pediatrics, Childrens Hospital Los Angeles & Keck School of Medicine, University of Southern California, mkipke@chla.usc.edu

George Weiss
Community, Health Outcomes, and Intervention Research Program, The Saban Research Institute, Childrens Hospital Los Angeles, 4650 Sunset Blvd, MS#30, Los Angeles, CA 90027, Department of Pediatrics, Childrens Hospital Los Angeles & Keck School of Medicine, University of Southern California, gweiss@chla.usc.edu

Abstract

We examined the prevalence and patterns of alcohol use within a large, ethnically diverse sample of young men who have sex with men (YMSM) and identified psychosocial correlates of these alcohol-use patterns. A sample of 526 YMSM (ages 18–24 years) was recruited in Los Angeles, CA using a venue-based, stratified probability sampling design. Based on criteria used by previous research with young adults, participants were assigned to one of four alcohol-use/non-use groups according to frequency and number of drinks per sitting in the last 30 days. Findings revealed a high prevalence of alcohol use (91%) within the sample, with 21% reporting binge drinking; of binge drinkers, 40% reported frequent binge drinking. Multinomial logistic regression analyses revealed that race/ethnicity, gay bar attendance, depression, sensation seeking, peer risk behaviors, and age of alcohol initiation significantly differentiated between non-/light users from frequent and binge drinkers. Results also indicated unique psychosocial profiles among frequent/binge drinkers. The heterogeneity of predictors associated with different patterns of alcohol use highlight the need to consider unique risk profiles and alcohol-use trajectories according to exposure to different risk and protective factors.

Future correspondence and requests for reprints should be sent to: Carolyn F. Wong, PhD, Community, Health Outcomes, and Intervention Research Program, Childrens Hospital Los Angeles, 4650 Sunset Blvd, MS#30, Los Angeles, CA 90027, Phone: 323-361-8427, Fax: 323-361-8064, cawong@chla.usc.edu.

1. Introduction

Adolescence and early adulthood is a time when young people typically begin to engage in risky behaviors (Arnett, 2005), including initiation and escalation of alcohol use and experimentation with other illicit substances (Bachman, Johnston, O'Malley, & Schulenberg, 1996; Muthen & Muthen, 2000). Over the life course, alcohol use is highest during the teen years and early twenties, with a precipitous drop in alcohol consumption occurring as young people begin to assume adult roles, such as employment and family (Bachman, O'Malley, & Schulenberg, 2002; Maggs & Schulenberg, 2004/2005). Not all individuals, however, follow this same pattern. Some youth never progress from experimentation to regular use, while others' use continues to rise throughout their twenties (Tucker, Orlando, & Ellickson, 2003).

Numerous studies have focused on alcohol-use patterns within the general population of adolescents and young adults, reporting a range of factors associated with increased use and misuse, including but not limited to: family history of alcohol misuse (Adalbjarnardottir & Rafnsson, 2001; Chassin, Pillow, Curran, Molina, & Barrera, 1993; Ellickson, Tucker, Klein, & McGuigan, 2001; Jackson, Henrickson, & Dickinson, 1999), enrollment in college, increased impulsivity/sensation seeking (Arnett, 2005; Raskin White & Jackson, 2004/2005), stressful life events (Wills, 1992), distress (Jackson & Sher, 2003), peer risk behaviors and norms (Andrews, Tildesley, Hops, & Li, 2002; Chassin et al., 1993; Li, Barrera, Hops, & Fisher, 2002; Musher-Eizenman, Holub, & Arnett, 2003), age of initiation (DeWit, Adlaf, Offord, & Ogborne, 2000; Ellickson et al., 2001; Hawkins et al., 1997), and ethnicity, with the highest rates reported by Caucasians (Raskin White & Jackson, 2004/2005).

One group of young people who reportedly are at greater risk for alcohol use and misuse are young men who have sex with men (YMSM) who may or may not self-identify as gay or bisexual (Greenwood et al., 2001). While YMSM use alcohol and other drugs for many of the same reasons as their heterosexual peers, YMSM are believed to be at greater risk for alcohol use and misuse because of the rejection, stigmatization, and social isolation many experience due to their sexual identity (D'Augelli & Herschberger, 1993; Gonsiorek, 1988; Hunter & Mallon, 1999; Ryan & Futterman, 1997; Savin-Williams, 1990). Rather than feel alone and isolated, many YMSM may seek out and spend time in gay-identified venues, such as gay bars, where they may find acceptance, but also have unfettered access to alcohol and other illicit substances (McKirnan, Ostrow, & Hope, 1996).

To date, limited studies have sought to characterize the alcohol-use patterns of YMSM, such as frequent and binge drinking, and even fewer studies have attempted to examine whether experiences such as "coming out" to family and friends, feeling acceptance and/or rejection from family and friends, involvement in and connectedness to the gay community, and gay bar attendance would be associated with YMSM's alcohol-use patterns (Greenwood et al., 2001). The limited research that has been conducted with YMSM has tended to focus on their use of illicit drugs, with there being increasing evidence that YMSM are significantly more likely than heterosexual youth to report lifetime and recent use of illicit drugs (Kipke, Weiss, Ramirez et al., 2007; Wolitski, Valdiserri, Denning, & Levine, 2001). Risk factors associated with high levels of drug use include a history of childhood sexual abuse (Hughes & Eliason, 2002), stressful life events (Rosario, Schrimshaw, & Hunter, 2004), gay-related verbal harassment and discrimination (Rosario, Rotheram-Borus, & Reid, 1996), and involvement in gay-related social events (Rosario et al., 2004). In addition, our own research showed that residential status is a significant predictor of club drug use (Kipke, Weiss, & Wong, 2007). Specifically, living at home was found to have a protective effect on club drug use among YMSM. Unfortunately, the vast majority of the studies have been descriptive in nature and conducted with small, non-representative samples of convenience. Indeed, a limitation of the existing literature is that most of the previous studies that examined the relationship between risk factors and risk

behaviors among YMSM have used convenience samples, which are difficult to generalize from.

In this paper, we report the prevalence of alcohol use, including frequent and binge drinking, and correlates of different alcohol-use patterns within a large and ethnically diverse sample of YMSM as part of the Healthy Young Men's (HYM) Study.

2. Method

2.2. Participants

A total of 526 subjects were recruited into the study between February of 2005 and January of 2006. Young men were eligible to participate in the study if they were: a) 18- to 24-years old; b) self-identified as gay, bisexual, or uncertain about their sexual orientation and/or reported having had sex with a man; c) a resident of Los Angeles County and anticipated living in Los Angeles for at least six months; and d) self-identified as Caucasian, African American, or Latino of Mexican descent.

2.3. Procedures

YMSM were recruited at public venues using the stratified probability sampling design developed by the Young Men's Study (MacKellar, Valleroy, Karon, Lemp, & Janssen, 1996) and later modified by the Community Intervention Trials for Youth (Muhib et al., 2001). Study participants were recruited from 36 different public venues that had previously been identified as settings in which YMSM spend time and/or "hang out". (For more information on the sampling procedures, please see (Kipke, Kubicek et al., 2007; Kipke, Weiss, & Wong, 2007). The survey was administered at a location convenient to the participant, either the project office or at a public venue that provided Internet connectivity.

2.4. Measures

The survey was administered in both English and Spanish using computer-assisted interview (CAI) technologies and an on-line testing format. The CAI software used in this study incorporated sound files that allowed participants to silently read questions on the computer screen and/or listen to the questions read through headphones and enter their responses directly into the computer. The survey required 1-1/2 hours to complete. Participants received $35 as compensation for their time and effort. Analyses were performed with the following variables:

Socio-demographic variables—Participants reported a variety of information including their age; race/ethnicity; sexual identity; sexual attraction; place of residence; employment status/school enrollment; history of homelessness; ever "exchanged a sexual act or favor for something like money, drugs, or a place to stay;" and participation in the street economy (e.g., selling drugs, prostitution, panhandling).

Family history of alcohol or drug abuse—A single dichotomous item asked participants, when applicable, whether anyone in their family had a drug or alcohol problem growing up.

Awareness of sexuality—Participants were asked how many of their family, best/closest friends, and other friends know about their sexual identity, attractions, or behavior, here referred to as "out to friends and family". Mean scores were calculated from responses to this 6-item measure with a 4-point scale that ranged from "none" to "all". A greater score indicated more people were aware of participants' sexuality. This scale was developed during the formative phase of the study (Cronbach's $\alpha = 0.85$).

Physical and sexual abuse—To assess physical abuse, participants were asked if, while growing up, they had ever been hit so hard by someone in their home that it left a bruise or required medical help. To assess sexual abuse, they were asked whether they had ever been sexually abused or assaulted as a child or when growing up. These are dichotomized times.

Depression—Using the 20-item Center for Epidemiologic Studies Depression (CES-D) Scale (Ryff & Keyes, 1995), participants reported whether they had experienced depressive symptoms in the past week. We summed the items and created cut-points based on previous research conducted with MSM (Stall et al., 2003): a score of 6 to 21 was considered distressed, a score of 22 or greater was considered depressed (Cronbach's $\alpha = 0.90$).

Health as a value—Participants responded to a previously modified version of Lau's 4-item Health as a value scale (Lau, Hartman, & Ware, 1986; Ritt-Olson et al., 2005). A mean was taken from this measure that used a 4-point Likert-type scale that ranged from "not true" to "completely true" (Cronbach's $\alpha=0.63$).

Life satisfaction—A single item assessed how happy participants have been with their personal life within the past 12 months. Responses on a 5-point Likert-type scale ranged from "not happy at all" to "extremely happy".

Peer risk behaviors—Participants were asked to report if and how many of their five closest friends engage in a variety of risk behaviors including drug use, alcohol use and risky sex using a 4-point Likert-type scale that ranged from "none of them" to "all of them" (Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993). The mean score was used (Cronbach's $\alpha=0.81$).

Sensation seeking—Participants completed a 6-item sensation seeking scale from Zuckerman's Sensation Seeking Form V (Wills, 1986). A mean score was derived from responses on a 4-point scale that ranged from "definitely no" to "definitely yes" (Cronbach's $\alpha=0.81$).

Stressful life events—Participants were asked if they had experienced one or more stressful events during the previous 3 months (Nott & Vedhara, 1995). A total score was calculated by summing the number of items checked; a score of 11 or more (top 75th percentile) was considered highly stressed (Cronbach's $\alpha=0.76$).

Connectedness to the gay community and bar/club attendance—Using a 7-item scale, participants were asked to report how often in the past three months they had engaged in gay community activities such as reading gay newspapers, attending gay organizational meetings, how many gay and lesbian friends they have and how much they "feel a part of the gay community" (Greenwood et al., 2001). Gay bar attendance was separated out from the scale for analysis, as prior studies have found it to be independently associated with alcohol use (Presley & Pimental, 2006). A mean score derived from the 5-point Likert-type scale ranged from "never" to "several times a week or every day" was used for current analyses, whereby a higher score indicated greater community involvement (Cronbach's $\alpha=0.60$).

Alcohol use—A series of questions asked participants about their lifetime, past 3-month, past 30-day use of alcohol, at what age they first drank alcohol, and on average the number of drinks they consume in one sitting. Heavy and frequent use were classified using criteria from previous research conducted with young adults (McNall & Remafedi, 1999), whereby *frequent use* was defined as alcohol use for three or more days during a week, and *binge drinking* was defined as 5 or more drinks within a single sitting within a week (Presley & Pimental, 2006). Thus, participants were assigned to one of four groups based on the number of days they drank

in the last 30 days and average number of drinks they consumed at any one sitting: *non-users*/*light users* (not used alcohol ever or drinking <3 days/week and < than 5 drinks/sitting) [1], *frequent users* (drinking >3 days/week but < than 5 drinks/sitting), *occasional binge users* (drinking <3 days/week but ≥ 5 drinks/sitting), or *frequent*/*binge users* (drinking ≥3 days/week and ≥5 drinks/sitting).

2.5. Statistical Analysis

The study was exploratory in nature, and although no hypotheses were proposed, the analyses were informed by existing literature. Chi-square analyses tested how categorical demographic and psychosocial predictors differed across the four alcohol-use groups. Analyses of variance (ANOVA) and the Kruskal-Wallis tests examined mean differences of continuous variables between the alcohol-use groups. Post-hoc, pair-wise comparisons using the Bonferroni correction or the Mann-Whitney tests (using an adjusted p-value of ≤ .01 for conducting multiple tests) examined differences in these factors within the four alcohol-use groups.

Then, a multinomial logistic regression analysis was performed where the dependent variable "alcohol use" has four categories with "non-/light users" category serving as the reference group. A step-wise approach determined the final model, whereby explanatory variables, significant at p ≤.05 or nearly significant at p ≤.10 based on the likelihood ratio chi-square tests, were retained. The estimation of a multinomial logistic, regression model tested whether adjusted odds ratios of explanatory variables would be significantly different between the categories of frequent/binge alcohol use and the reference group of non-/light users. Finally, because few studies investigated the heterogeneity of different patterns of alcohol use, additional analyses using the Wald chi-squared tests, tested the equality of pairs of adjusted odds ratios among the frequent/binge alcohol drinking groups. Specifically, differences in predictors were examined between the following groups: 1) frequent drinkers vs. frequent bingers; 2) occasional bingers vs. frequent drinkers; and 3) occasional bingers vs. frequent bingers.

3. Results

3.1. Sample Characteristics

As summarized in Table 1, a total of 526 YMSM were enrolled in the study. The average age was 20.1 years (SD=1.58), with 40% of the sample being 18–19 years of age. The vast majority (91%) of participants reported having used alcohol at least once in their lifetime, with 86% reporting alcohol use in the last three months, and 84% within the last 30 days. Twenty-one percent of the sample qualified as binge drinkers and, among them, 40% binge drink frequently. Over half (53%) of the participants reported living at home with their family, and 13% reported being neither in school nor employed. Eighty-one percent self-identified as gay or some other same-sex sexual identity, and 16% identified as bisexual. In contrast, 71% of the sample reported being sexually attracted to males exclusively, and 27% to both males and females. Nine percent reported being sexually assaulted when growing up, 16% reported having exchanged sex for money or something else, and 7% reported a history of living on the streets.

3.2. Socio-demographic and Psychosocial Risk Factors for Alcohol Use: Univariate Findings

Consistent with previous findings, results from univariate analyses showed that non-/light users were more likely to report living with their families than frequent users and frequent bingers ($Chi^2(3)=11.38$; p≤.01), as reported in Table 2a. African American participants were more likely to be non-/light users compared to Caucasian participants, who in turn were more likely

[1]Preliminary analyses revealed great similarities between non-users and light users of alcohol. As a result, the two groups were combined in the present analyses.

to be frequent drinkers or frequent bingers ($Chi^2(6)=30.89$; $p\leq.001$). Frequent drinkers and frequent bingers reported they were more likely to go out to gay bars more than once a week ($Chi^2(6)=49.75$; $p\leq.001$) than non/light users, and as shown in Table 2b, they also reported a greater number of friends who engage in risk behaviors compared to non-/light users ($p\leq.001$). Occasional bingers also reported having significantly fewer friends who engage in risk behaviors compared to frequent bingers ($p\leq.001$). While frequent users were found to be significantly older than the other groups ($Chi^2(6)=14.46$; $p\leq.05$), all three frequent/binge alcohol-use groups (frequent users, occasional bingers, and frequent bingers) were significantly more likely to initiate drinking at a younger age than non-/light users ($Chi^2(3)=32.92$; $p \leq .001$). There were no significant differences between the different alcohol-use groups in terms of growing up with a family member with a drug or alcohol problem.

Psychosocial factors also differentiated the four alcohol-use groups. Non-/light users reported fewer stressful life events ($Chi^2(3)=8.38$; $p\leq.05$) compared to occasional bingers, while occasional bingers were more likely to be distressed or depressed ($Chi^2(6)=12.62$; $p\leq.05$) compared to non/light users. There were also significant group differences in life satisfaction ($Chi^2(3)=8.97$; $p\leq.05$) among the alcohol-use groups where both non-/light users and frequent users were significantly more likely to report being satisfied with life ($p\leq.05$ and $p\leq.01$, respectively) than occasional bingers. In addition, there were significant differences in sensation seeking ($F(3, 519)=5.98$; $p\leq.001$) and health as a value ($Chi^2(3)=21.13$; $p\leq.001$) among the drinking groups. Post-hoc analyses indicated that frequent bingers were significantly more likely to be sensation seekers ($p\leq.001$) than non-/light users, and that non-/light users as compared to frequent users and frequent bingers were more likely to value health (both p values are $\leq.01$). There were also significant group differences in being out to friends and family members ($F(3, 522)=4.28$; $p\leq.01$) and experiences of internalized homophobia ($F(3, 519)=3.55$; $p\leq.05$). Specifically, frequent bingers were more likely to be “out” to many of their friends and families ($p\leq.01$), and had significantly less internalized homophobia than non-/light users ($p\leq.01$). Among the variables examined, there were no differences among alcohol users with respect to their involvement in gay community, whether they were full-time students or employed full-time, and history of violence growing up (e.g., child physical abuse; sexual assault growing up).

3.3. Socio-demographic and Psychosocial Risk Factors for Alcohol Use: Multivariate Findings

Explanatory variables included in the final multinomial, logistic regression model were ethnicity, gay bar attendance, depression (CESD), sensation seeking, peer risk behaviors, and age of alcohol initiation. As presented in Table 3 and similar to univariate findings, frequent users and frequent bingers were significantly more likely to attend gay bars once a week (OR=2.86; CI=1.30,6.30; $p\leq.01$ and OR=2.55; CI=1.06,6.13; $p\leq.05$, respectively) or more than once a week (OR=6.30; CI=2.96,13.41; $p\leq.001$ and OR=5.69; CI=2.45,13.18; $p\leq.001$, respectively) relative to less than once a week compared to non-/light users. As was the case at the univariate level, African American YMSM compared to Caucasian YMSM were significantly less likely to be frequent users or frequent bingers (OR=.39; CI=.15,.92; $p\leq.05$ and OR=.23; CI=.07,.96; $p\leq.05$, respectively). In addition, both frequent users and frequent bingers were significantly more likely to have a greater number of friends who engage in risk behaviors than non-/light users (OR=1.82; CI=1.13,2.92; $p\leq.05$ and OR=2.08; CI=1.24,3.49; $p\leq.01$, respectively).

With respect to sensation seeking, the only significant difference was between frequent bingers and non-/light users (OR=2.55; CI=1.25,5.21; $p\leq.01$). Analyses further revealed that occasional binge drinkers were significantly more distressed (OR=3.17; CI=1.58,6.37; $p\leq.001$) or depressed (OR=2.50; CI=1.25,4.97; $p\leq.01$) than non-/light users. Compared to non-/light

users, each of the frequent/binge alcohol-use groups were less likely to have initiated drinking alcohol at an older age (ORs ranged from .80–.83; p values ranged from p≤.05 to p≤.001)

3.4. Differences Between Alcohol-use Groups

Additional analyses investigated whether there were significant group differences in demographic and psychosocial risk factors among the frequent/binge alcohol-use groups. Comparisons of adjusted odds ratios between frequent drinkers and frequent bingers did not reveal significant differences except for a trend suggesting that frequent bingers had a greater sensation-seeking score than frequent drinkers who did not binge (p=.07). In contrast, there were a number of factors that differentiated occasional bingers from both frequent drinkers and frequent bingers. First, occasional binge drinkers were significantly less likely to have peers who engage in risky behaviors when compared to frequent drinkers (OR=.51; CI=.28,.93; p≤.05) and frequent bingers (OR=.50; CI=.24,.84; p≤.05). Occasional binge drinkers were also significantly less likely to attend gay bars at least once a week (OR=.34; CI=.12,.89; p≤.05) or more than once a week than frequent drinkers (OR=.18; CI=.07, .45; p≤.001). They were also less likely than frequent bingers to attend gay bars more than once a week (OR=.20; CI=.07,1.07; p≤.01). Latino participants of Mexican descent compared to Caucasian participants were significantly more likely to be occasional drinkers than frequent drinkers (OR=2.79; CI=1.18,6.57; p≤.05) or frequent bingers (OR=2.52; CI=1.02,6.23; p ≤ .05). Finally, occasional binge drinkers were more likely to be distressed than frequent drinkers (OR=3.51; CI=1.35,9.09; p≤.01) and frequent bingers (OR=4.11, CI=1.41,12.01; p≤.01), and more depressed than frequent drinkers (OR=3.54; CI=1.34,9.36; p≤.05) and frequent bingers (OR=3.19; CI=1.14,8.84; p≤.05).

4. Discussion

Findings revealed a high prevalence of drinking among YMSM, with 84% of the sample having used alcohol in the last 30 days, and 21% qualifying as binge drinkers. Among the binge drinkers, 40% reported frequent binge drinking (i.e., binge drink 3+ days a week). The findings from this research revealed similar alcohol-use patterns to those reported by Greenwood et al. (2001) in a study of substance use among a sample of young gay and bisexual men (ages 18–29). While these rates are also comparable to a nationwide sample of college adolescents (Greenwood et al., 2001), among the heavy binge drinkers, a greater proportion of YMSM from this sample reported alcohol use three or more times a week and drinking five or more drinks per sitting. Specifically, in their college sample, Presley and Pimental (2006) found 37% of frequent drinkers to also binge drink, while in our current sample of YMSM, 44% of frequent drinkers also binge drink. Factors found to be significantly associated with different patterns of alcohol use in our population of YMSM include, age of initiation, having a greater number of friends who engage in risky behaviors, and being Caucasian. Contrary to previous studies, employment status or school attendance, having grown up with family members who had an alcohol and/or drug problem, and connectedness to gay communities were not associated with different alcohol-use patterns.

Multivariate findings revealed meaningful differences among individuals with distinct styles of alcohol use, which emphasize the value of conceptualizing alcohol use in terms of both the frequency of alcohol use and quantity of drinks consumed when drinking. For example, our study found occasional bingers to exhibit a particularly striking and unique demographic and psychosocial profile relative to the non-/light drinkers and to the other alcohol frequent/binge use groups. Specifically, occasional bingers were significantly more likely to be distressed or depressed. They had fewer friends who engage in risk behaviors and were less likely to have attended gay bars more than once a week. In addition, Latino participants were significantly more likely to be occasional bingers than frequent users or frequent bingers.

While these findings highlight the way alcohol users can be distinguished based on a wide range of demographic and psychosocial factors, it is important to note the limitations of this study. First, current findings rely on participants' self-reported behaviors, which cannot be independently verified. Self-report data regarding participants' involvement in risky behaviors and their psychological state may underestimate their true prevalence, given that many of these behaviors, such as alcohol use, and experiences of homophobia may be deemed socially undesirable. However, the use of ACAI should have minimized underreporting of these behaviors. In addition, due to the cross-sectional nature of this data, causal relationship between demographic and psychosocial risk factors and alcohol use cannot be ascertained. Finally, although this sample is likely to be representative of YMSM who can be recruited through gay-identified venues, it is not representative of the larger YMSM population. Indeed, alcohol use may be elevated within this segment of the YMSM population given that 43% were recruited from gay bars and clubs where they might have increased access to alcohol. However, given the rigor used to recruit participants into the study, one can be fairly certain of the generalizablity of these findings to those YMSM who spend time in these venues. This is key given that the ultimate goal of such research is to understand risks and identify opportunities for prevention and early intervention. Therefore findings presented here suggest that YMSM who frequent gay-identified venues are at increased risk for frequent and/or binge alcohol use, and that outreach strategies or early intervention should be targeted with young men who frequent these venues.

In fact, prior research with older MSM has found complex relationships between alcohol use and HIV risk behaviors, such as illicit drug use and unprotected anal sex (Caetano & Kaskutas, 1995). Additional research should examine the way predictors of different alcohol-use patterns are associated with other HIV risk behaviors and how these risk behaviors relate to one another among YMSM. Such findings could further inform interventions designed to minimize youths' engagement in a variety of risk behaviors. In particular, the role that gay bars play in the lives of YMSM and the increased risks associated with their attendance, highlights the importance of developing interventions that are integrated into gay bars, as well as interventions that offer alternative social spaces to gay bars for YMSM. As reported here, it was not the level of connectedness to a gay community, but the frequency with which YMSM attended bars which was associated with their frequent/binge drinking.

Additionally, study of the ways in which predictors of alcohol use may change or remain constant over the period of emerging adulthood is particularly important. Although current findings show African Americans to be least at risk for frequent/binge alcohol use, previous research suggest that alcohol use among African Americans peaks at a later age and tends to be more long-lasting. The study of how patterns of use and predictors of use change over time can shed light on ethnic-specific developmental issues that prompt frequent/binge alcohol use and may help to identify critical times for preventative interventions for YMSM of specific ethnic groups. Future research is needed to further explore the social and contextual influences that put some YMSM at increased risk for different alcohol-use patterns, as well the negative health outcomes associated with different patterns of use, such as risk for HIV infection. Indeed, while there has been considerable attention to the drug-use patterns of YMSM, comparatively little research has focused on risk factors associated with differing alcohol-use patterns. Moreover, little attention has been directed toward the prevention and early intervention of alcohol misuse among YMSM. Future research is therefore needed to inform the development of new intervention strategies that are both developmentally appropriate and culturally relevant to this youthful population.

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Table 1

Description of the Study Sample (N=526)

Variables	Categories	n (%)
Age	18 – 19 yrs	206 (39)
	20 – 21 yrs	196 (37)
	22+ yrs	124 (24)
Race/Ethnicity	African-American	126 (24)
	Mexican descent	205 (39)
	Caucasian	195 (37)
Immigration	Born in another country	82 (16)
Residence	Living with family	281 (53)
	Not living with family	245 (47)
School/work	In school	113 (21)
	In school, employed	142 (27)
	Employed, not in school	201 (38)
	Not employed, not in school	70 (13)
Sexual identity	Gay	391 (74)
	Other same-sex identity	38 (7)
	Bisexual	85 (16)
	Straight	3 (1)
	DK/RF	9 (2)
Sexual attraction	Males only	371 (71)
	Males and females	144 (27)
	Females only	6 (1)
	Neither, don't know, missing	5 (1)
Sex exchange	Ever	85 (16)
	Past 6 months	33 (6)
Living on the street	Ever	36 (7)
Alcohol Use	Lifetime	477 (91)
	Last 3 months	450 (86)
	Last 30 days	441 (84)
	Avg. # of days spend drinking	Range: 1–30 m=7.69;sd=6.26
	Avg. # of drinks per sitting	Range: 1–20 m=3.89;sd=2.95
	Binge drinking in the last 30 days	112 (21)
Categories of Alcohol Use	Non/light users	356 (68)
	Frequent users	58 (11)
	Occasional bingers	67 (13)
	Frequent bingers	45 (8)

Table 2

Table 2a. Differences in key socio-demographic and psychosocial characteristics among alcohol use groups (N=526)
Table 2b. Mean frequencies and differences in key psychosocial variables for alcohol use groups (N=526)

	Total Sample	**Non or Light Users (0)**	**Frequent Users (1)**	**Occasional Bingers (2)**	**Frequent Bingers (3)**
	N=526	**n=356**	**n=58**	**n=67**	**n=45**
	n *(%)*	**n *(%)***	**n *(%)***	**n *(%)***	**n *(%)***
Age*					
18–19	206 *(39)*	147 *(41)*	15 *(26)*	30 *(45)*	14 *(31)*
20–21	196 *(37)*	128 *(36)*	20 *(34)*	27 *(40)*	21 *(47)*
22+	124 *(24)*	81 *(23)*	**23*(40)***	10 *(15)*	10 *(22)*
Race/Ethnicity***					
A	126 *(24)*	**102*(29)***	9 *(16)*	10 *(15)*	5 *(11)*
M	205 *(39)*	139 *(39)*	16 *(28)*	36 *(54)*	14 *(31)*
W	195 *(37)*	115 *(32)*	**33*(57)***	21 *(31)*	**26*(58)***
Residence**					
Not with family	245 *(47)*	150 *(42)*	**37*(64)***	33 *(49)*	25 *(56)*
With family	281 *(53)*	**206*(58)***	21 *(36)*	34 *(51)*	20 *(44)*
School/Work					
In school only	113 *(22)*	85 *(24)*	7 *(12)*	12 *(18)*	9 *(20)*
In school and employed	142 *(27)*	101 *(28)*	14 *(24)*	16 *(24)*	11 *(24)*
Employed only	201 *(38)*	123 *(35)*	31 *(53)*	30 *(45)*	17 *(38)*
Not in school or employed	70 *(13)*	47 *(13)*	6 *(10)*	9 *(13)*	8 *(18)*
When you were growing up did anyone in your family have an alcohol or drug problem[a]?					
No	258 *(50)*	182 *(52)*	29 *(52)*	25 *(38)*	22 *(50)*
Yes	259 *(50)*	169 *(48)*	27 *(48)*	41 *(62)*	22 *(50)*
Gay bar attendance***					
Less than once a week	286 *(54)*	217 *(61)*	15 *(26)*	40 *(61)*	14 *(31)*
Once a week	130 *(25)*	86 *(24)*	17 *(29)*	15 *(23)*	12 *(27)*
More than once a week	109 *(21)*	53 *(15)*	**26*(45)***	11 *(17)*	**19*(42)***
Mental Health (CESD)* [a]					
non-distress/non-depress	320 *(61)*	226 *(63)*	37 *(64)*	28 *(42)*	29 *(64)*
Distressed	97 *(18)*	59 *(17)*	11 *(19)*	**20*(30)***	7 *(16)*
Depressed	108 *(21)*	70 *(20)*	10 *(17)*	**19*(28)***	9 *(20)*
Stressful Life Events* [a]					
< 75th percentile	377 *(72)*	**268*(75)***	40 *(69)*	41 *(61)*	28 *(62)*
>= 75th percentile	148 *(28)*	87 *(25)*	18 *(31)*	26 *(39)*	17 *(38)*
Sexual assault growing up [a]					
No	469 *(91)*	318 *(91)*	49 *(88)*	62 *(93)*	40 *(89)*
Yes	49 *(9)*	32 *(9)*	7 *(12)*	5 *(7)*	5 *(11)*
Child physical abuse [a]					
No	418 *(80)*	281 *(80)*	46 *(81)*	55 *(82)*	36 *(80)*
Yes	104 *(20)*	72 *(20)*	11 *(19)*	12 *(18)*	9 *(20)*

	Total Sample	Non or Light Users (0)	Frequent Users (1)	Occasional Bingers (2)	Frequent Bingers (3)
	N=526	n=356	n=58	n=67	n=45
	M *(SD)*	M *(SD)*	M *(SD)*	M *(SD)*	M *(SD)*
Gay community involvement	2.25 *(0.57)*	2.22 *(0.57)*	2.37 *(0.47)*	2.27 *(0.59)*	2.33 *(0.62)*
Health as a value***[b]	3.38 *(0.53)*	3.45 *(0.48)* [1,3]	3.25 *(0.54)* [0]	3.34 *(0.54)*	3.05 *(0.67)* [0]
Internalized homophobia *[a]	2.09 *(0.30)*	2.11 *(0.30)* [3]	2.07 *(0.31)*	2.08 *(0.29)*	1.96 *(0.30)* [0]
Out to friends and family** [a]	2.94 *(0.78)*	2.87 *(0.78)* [3]	3.15 *(0.68)*	2.98 *((0.80)*	3.20 *(0.76)* [0]

	Total Sample N=526 n *(%)*	Non or Light Users (0) n=356 n *(%)*	Frequent Users (1) n=58 n *(%)*	Occasional Bingers (2) n=67 n *(%)*	Frequent Bingers (3) n=45 n *(%)*
Sensation seeking ***a	3.20 *(0.60)*	3.13 *(0.59)* [3]	3.29 *(0.53)*	3.28 *(0.62)*	3.49 *(0.56)* [0]
Peer risk behaviors *** b	1.85 *(0.65)*	1.76 *(0.60)* [1,3]	2.14 *(0.73)* [0]	1.85 *(0.65)* [3]	2.22 *(0.71)* [0,2]
Life satisfaction *b	3.31 *(0.89)*	3.33 *(0.89)* [2]	3.48 *(0.86)* [2]	3.06 *(0.92)* [0,1]	3.36 *(0.91)*
Age of alcohol initiation *** b	16.42 *(2.81)*	16.96 *(2.56)* [1,2,3]	15.36 *(3.14)*[0]	15.72 *(2.57)* [0]	15.11 *(3.38)* [0]

Note. Bolded values indicate cells with high standardized residuals to show specific significant group differences

[a]Due to not applicable or invalid responses, these variables have denominators that are less the 526; the denominator for family history of alcohol or drug problem is 517; mental health is 525; stressful life events is 525; sexual assault is 518; child physical abuse is 522.

* $p \leq .05$;

** $p \leq .01$;

** $p \leq .001$

Note. For each of the variables, the greater the value, the more true for the particular construct

[a]Results from post-hoc pairwise comparisons based on the Bonferroni correction are reported in superscripts;

[b]Results from pairwise Mann-Whitney tests ($p < .01$) are reported in superscripts.

* $p \leq .05$;

** $p \leq .01$;

*** $p \leq .001$

Table 3

Multinomial logistic regression of four categories of alcohol use/misuse on psychosocial and socio-demographic characteristics (N = 466)[a]

	Frequent Users (1) n = 57		**Occasional Bingers (2) n = 65**		**Frequent Bingers (3) n = 44**	
	OR	95% CI	OR	95% CI	OR	95% CI
Race/Ethnicity						
W						
A	**0.39***	(0.15, 0.92)	.68	(0.29, 1.58)	**0.23***	(0.07, 0.96)
M	0.60	(0.30, 1.22)	1.68	(0.88, 3.20)	0.67	(0.31, 1.43)
Gay bar attendance						
Less than once a week						
Once a week	**2.86****	(1.30, 6.30)	0.98	(0.49, 1.96)	**2.55***	(1.06, 6.13)
More than once a week	**6.30*****	(2.96, 13.41)	1.13	(0.52, 2.48)	**5.69*****	(2.45, 13.18)
Depression (CESD)*						
non-distress/non-depress						
Distressed	0.90	(0.40, 2.05)	**3.17*****	(1.58, 6.37)	0.77	(0.30, 2.02)
Depressed	0.71	(0.31, 1.61)	**2.50****	(1.26, 4.97)	0.38	(0.32, 1.90)
Sensation seeking	1.21	(0.72, 2.04)	1.33	(0.72, 2.04)	**2.55****	(1.25, 5.21)
Peer risk behaviors	**1.82***	(1.13, 2.92)	0.93	(1.13, 2.92)	**2.08****	(1.24, 3.49)
Age of alcohol initiation	**0.80*****	(0.71, 0.90)	**0.82*****	(0.71, 0.90)	**0.83***	(0.72, 0.96)

Note. Reference group = light/non-users (n = 300). Likelihood Ratio Chi^2(27) =138.30, p < .001; BIC = 1003.85;

Bolded values indicate OR significant at ≤ .05.

[a] Multivariate analyses based on 466 participants (60 were omitted due to not applicable/missing values)

* p ≤ .05;

** p ≤ .01;

*** p ≤ .001.