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Minority Stress and Alcohol Use in Sexual Minority Women's Daily Lives

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Abstract

Sexual minority women (i.e., women who identify as lesbian, bisexual, or other non-heterosexual orientations) report more hazardous drinking compared to heterosexual women. Sexual minority stress (SMS), or experiences related to sexual orientation-based discrimination and marginalization, have been implicated as contributing to these disparities. The association between sexual minority stress and alcohol use has been supported in cross-sectional, and to a limited extent, longitudinal studies. Few studies, however, have examined associations between SMS and alcohol use in sexual minority women's daily lives. Young sexual minority women (age 18–35; $N=321$) were recruited to participate in a 14-day daily diary study in which they reported each morning on their SMS and alcohol use (drinking or not; drinking quantity; alcohol consequences) from the previous day. SMS was operationalized in four ways (global negative SMS experiences, specific SMS events, concealment of identity, discrimination). Results from concurrent multilevel models revealed that on days when sexual minority women experienced more global negative SMS, any specific SMS event, or discrimination, they were more likely to drink. Further, prospective models indicated that participants drank more and were more likely to report binge drinking on the day after they experienced at least one SMS event. These findings extend prior research by demonstrating that the association between SMS and alcohol use extends to the daily level of analysis among sexual minority women. Understanding the connection between SMS and alcohol use among sexual minority women is imperative to developing culturally-tailored interventions to improve the health and well-being of this at-risk group.

Keywords

minority stress; sexual minority women; alcohol use; daily diary

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Sexual minority women (i.e., women who identify as lesbian, bisexual, or other non-heterosexual orientations) are at greater risk for harmful drinking as compared to their heterosexual counterparts (Gonzales et al., 2016; Hughes et al., 2020; Kahle et al. 2019; Wilsnack et al., 2008). For example, relative to heterosexual adult women, sexual minority women have higher rates of past 30-day binge drinking (4 or more standard drinks on a single occasion) and high intensity drinking (8 or more standard drinks on a single occasion; Fish et al., 2018). Sexual minority women also are more likely to be diagnosed with an alcohol use disorder in the past 12 months (Kerridge et al., 2017; Schuler & Collins, 2020). Further, younger sexual minority women (18 to 39 years old) may be particularly at risk for heavy drinking as compared to older sexual minority women (Veldhuis et al., 2017), highlighting the importance of understanding factors associated with alcohol use among young sexual minority women. The high rates of alcohol use are alarming given the association between drinking and negative mental health outcomes (Drabble et al., 2018; Mereish et al., 2015), which may disproportionately impact sexual minority women. Thus, to improve the health and well-being of sexual minority women, it is critical to identify factors that may contribute to alcohol use in sexual minority women to help inform the development of effective interventions.

Sexual Minority Stress and Alcohol Use

Minority Stress Theory (Hatzenbuehler, 2009; Meyer, 2003) has been used to explain the health disparities experienced by sexual minority individuals at the person level. This theory posits that, in addition to general stress, sexual minority individuals experience both distal (e.g., discrimination, etc.) and proximal (e.g., internalized homophobia, etc.) stressors related to having sexual minority identities. These unique, stressful experiences have been termed sexual minority stress (SMS). SMS is associated with negative health outcomes and health behaviors, including alcohol misuse and alcohol-related consequences (Meyer, 2003; Hatzenbuehler, 2009; Institute of Medicine, 2011; National Academies of Sciences, Engineering, and Medicine, 2020). Indeed, a large body of cross-sectional research among sexual minority individuals, including sexual minority women, indicates that experiencing SMS is associated with heightened alcohol use (Livingston et al., 2016), alcohol abuse (Lehavot & Simoni, 2011), alcohol-related consequences (Lewis et al., 2017), and alcohol use disorder (Slater et al., 2017). These cross-sectional studies provide evidence that sexual minority women who experience more SMS also report more alcohol use and alcohol-related problems.

Traditional longitudinal designs, whereby participants are assessed over months or years, have also been used to examine the association between SMS and alcohol outcomes for sexual minority women. For example, a longitudinal study of sexual minority women found that SMS was associated with experiencing alcohol consequences, but not with greater alcohol consumption, one year later (Wilson et al., 2016). Additionally, a 4-year longitudinal study of sexual minority women found that discrimination was associated with binge drinking and adverse alcohol-related consequences (e.g., social-interpersonal consequences, academic/occupational consequences, blackout drinking) two years later through emotion dysregulation (Fitzpatrick et al., 2020). However, in contrast, a recent longitudinal study demonstrated that among sexual and gender minority individuals assigned female at birth

(i.e., including individuals who are transgender), various SMS experiences (e.g., sexual orientation-based microaggressions, victimization) were concurrently (i.e., measured at the same timepoint) associated with alcohol use and problems but were not associated with alcohol use or problems six months later (Dyar et al., 2020). Taken together, these studies provide some evidence that experiencing SMS may have both current, as well as enduring implications for alcohol use and problems.

Minority Stress and Alcohol Use in Daily Life

Cross-sectional research and traditional longitudinal research that assesses people over longer timeframes suggests that experiences of SMS are associated with alcohol use and related problems (Fitzpatrick et al., 2020; Hatzenbuehler, 2009; Lehavot & Simoni, 2011; Lewis et al., 2017; Lick et al., 2013; Meyer, 2003; Wilson et al., 2016). There is relatively less research that has examined these associations in sexual minority women's daily lives using naturalistic assessment approaches over short timeframes, such as daily diary methods. This limitation is noteworthy because daily data provide important information on the temporality of associations among psycho-behavioral phenomena (Shiffman et al., 2008), are more ecologically valid, and have less potential for retrospective recall biases than cross-sectional or traditional longitudinal survey data. Furthermore, daily data can help to extend the type of research questions addressed from typical between-person (e.g., cross-sectional survey) research that addresses *who* questions (e.g., are sexual minority women *who* experience SMS more likely to drink more?) by permitting the examination of *when* questions at the within-person level (e.g., on days *when* sexual minority women experience SMS, do they also drink more?). While there exists a larger body of daily diary research focused on stressful days and drinking with general populations (Armeli et al., 2000; Ayer et al., 2011; Grzywacz & Almeida, 2008; Mohr et al., 2001; Park et al., 2004), limited research has examined whether the positive association extends to sexual minority individuals. One exception is a study that focused on heavy drinking sexual minority men which found that experiencing more daily general stress (e.g., arguments or disagreements, work-related stress) was associated with greater alcohol use on the same day (Mereish et al., 2018).

Beyond general stress, it is important to consider the unique stressors that sexual minority individuals experience, as minority stress has been implicated in health disparities among sexual minority women (Institute of Medicine, 2011; National Academies of Sciences, Engineering, and Medicine, 2020). A recent ecological momentary assessment study (using five assessments each day) with sexual and gender minority college students demonstrated that momentary sexual minority discrimination was associated with individuals' general substance use (i.e., defined as any alcohol or drug use) both at the same assessment timepoint, as well as several hours later (i.e., the next assessment; Livingston et al., 2017). Further, findings from what appears to be the only existing study that has examined daily associations between SMS and alcohol use among sexual minority women showed that sexual minority women reported more alcohol consequences on days when they experienced SMS; however, SMS was not associated with same-day drinking quantity or next-day drinking quantity or alcohol consequences (Dyar et al., 2021).

Whereas daily stress has been associated with same-day drinking in general populations (Armeli et al., 2000; Ayer et al., 2011; Grzywacz & Almeida, 2008; Mohr et al., 2001; Park et al., 2004), there remains very little work examining the association between daily SMS and same-day alcohol use and consequences among sexual minority women. With the exception of the investigation by Dyar et al. (2021), which restricted SMS definition and assessment to a single question (and construct), there appear to be no other published studies examining this association. The current study extends the Dyar et al. (2021) findings in two notable ways relating to assessment of SMS and alcohol use. With regard to SMS, Dyar et al. (2021) measured daily SMS with a single item assessing general negative experiences of SMS on the previous day. The current study examines a range of SMS experiences that sexual minority women may encounter and their associations with various drinking outcomes using daily diary designs. Specifically, we asked both a general question (cf. Dyar et al., 2020; Mohr & Sarno, 2016), as well as specific SMS events, as well as assessing stress related to concealment of sexual identity and experiences of discrimination. This multifaceted approach to assessing SMS captures both perceptions of external events such as discrimination and experiencing microaggressions as well as internal stressors such as concealment of identity. Regarding alcohol use, Dyar et al. (2021) assessed alcohol consumption with a single item that asked about how many standard drinks the participants had the previous day. In the current study, we went beyond drinking quantity by also considering risky drinking or binge drinking as prior research has found sexual minority groups to be especially vulnerable (see review by Hughes et al., 2020). Understanding the consequences and health effects of binge drinking is particularly important as exceeding the binge drinking threshold is associated with more alcohol-related harms (NIAAA, 2020). Thus, given the increased binge drinking odds for sexual minority women (e.g., Gonzales et al., 2016; Wilsnack et al., 2008), the risk for drinking-related consequences may also be elevated among this vulnerable population.

Study Purpose

This study examined the concurrent and lagged associations for experiences of daily sexual minority stress and alcohol use and drew data from a larger study of same-sex female couples. In an effort to enhance the evidence-base on the implications of daily fluctuations in stress-related experiences among a community-based sample of sexual minority women, the present study aimed to examine associations between different types of SMS and: (1) alcohol use (i.e., drinking likelihood, drinking quantity, binge drinking likelihood) and alcohol-related consequences that occur on the same day; (2) alcohol use and alcohol-related consequences that occur on the next day. It was hypothesized that days with SMS experiences (i.e., global negative SMS, specific SMS events, discrimination, and concealment) would be associated with greater same-day alcohol use and consequences (i.e., greater likelihood of drinking and binge drinking, greater quantity of drinking, more drinking-related consequences) as compared to days without SMS experiences. It was also expected that similar associations would emerge when examining lagged associations between SMS experiences and next-day alcohol use and consequences.

This study addresses methodological limitations identified in a recent scoping review of the literature on sexual minority women and alcohol and drug use. Hughes et al. (2020)

emphasize the importance of moving beyond cross-sectional study designs, considering multiple aspects of sexual orientation (e.g., identity, attraction, behavior), and examining potential underlying mechanisms contributing to substance use disparities. Findings from the current daily diary study may provide important information that can help inform the development of culturally-sensitive alcohol misuse-focused interventions for sexual minority women, an overlooked population (Institute of Medicine, 2011; National Academies of Sciences, Engineering, and Medicine, 2020), and contribute to this vastly understudied integral line of research.

Method

Participants

Participants were recruited into a larger study focusing on sexual minority stress, relationships factors and health behaviors (including alcohol use) as part of a cisgender female couple with assistance from a market research firm with experience recruiting sexual minority individuals for online research studies. The firm initially provided the researchers with 930 individuals who were potentially eligible for the larger study. Approximately 13% ($n = 124$) did not complete the screener to determine eligibility. Another 46% ($n = 430$) did not meet one of the individual or couple eligibility criteria (described below). Three-hundred seventy-six participants were invited to participate in the study, and 55 of these participants either did not consent, complete baseline, or complete the daily surveys. Thus, the final sample included 321 sexual minority women between ages 18 to 35 (mean age = 27.56; $SD = 3.67$). All 321 women provided at least two daily diary survey reports.

In addition to age, inclusion criteria were: (1) identify as a cisgender woman; (2) currently in a same-sex relationship for at least three months duration in which they see one another at least once per week; and (3) able to fill out a daily diary survey each morning. Also, at least one member of the couple had to meet the following criteria: (1) endorse being only or mostly attracted to women (rather than attraction to both men and women); (2) consume alcohol on at least three days during the past two weeks; (3) engage in binge drinking at least once in the past two weeks (defined as consuming at least four drinks in one sitting). As sexual orientation is complex and consists of identity, attraction, and behavior, our goal was to recruit a sample of women who were both attracted to women and engaged in same-sex relationship behavior. Descriptive information about the sample is presented in Table 1.

Procedure

After eligibility and interest were verified by both couple members, each partner was emailed separately with information about the study and an informed consent document. To enroll in the study, both partners needed to provide consent and complete a baseline questionnaire prior to starting the daily diary portion of the study. Beginning the day after baseline was completed, each participant was sent an individual link at 6:00 am for 14 days with instructions to complete the survey between 6:00 am and 12:00 pm. Each daily survey took about 5 minutes to complete. Participants were instructed to complete all surveys in the study independently from their partners. Each participant could earn up to \$77.00

(\$25 for the baseline survey; \$3 for each of 14 daily surveys completed; \$10 bonus for completing 80% [11/14 days] of the daily surveys). The present study was approved by the university's Institutional Review Board and followed the APA ethical guidelines (APA, 2017). Additional details about the study's procedure are provided in Heron et al. (2019).

Measures

Daily Alcohol Use, Alcohol Quantity, and Binge Drinking—Participants indicated whether any drinking occurred the previous day (*yes/no*). If drinking was endorsed, they reported the number of standard alcoholic drinks consumed. If participants reported consuming four or more standard drinks, this was coded as a binge drinking day. Three outcomes were examined based on these questions: alcohol use (*yes/no*), drinking quantity (number of standard drinks), and binge drinking (*yes/no*).

Alcohol Consequences—Alcohol consequences were assessed with items from the Brief Young Adult Consequences Questionnaire (B-YAACQ, Kahler et al., 2005) that were adapted by Braitman et al. (2016) for daily administration. When participants reported drinking the previous day, they responded (*yes/no*) to 12 items that describe "...things that sometimes happen to people either during, or after they have been drinking alcohol" such as saying or doing embarrassing things, taking risks, and feeling sick or hung over. A dichotomous score was calculated to reflect whether participants reported any consequences (*yes/no*) related to their drinking the previous day.

Global Negative SMS—A single item of global negative SMS was adapted from a previous daily diary study of lesbian, gay, and bisexual young adults (Mohr & Sarno, 2016). This adaptation was also used in a recent study of alcohol use among sexual minority women (Dyar et al., 2021). Participants were asked a general question: "Did any negative events occur yesterday that were related to your being a sexual minority or to sexual orientation issues" and responded in a dichotomous (*yes/no*) format.

SMS Events—Daily sexual minority stressors were assessed with an 8-item measure, the Daily Sexual Minority Stressors Scale (DSMSS; Heron et al., 2018). Participants were asked, "For each of the following statements, rate how much this experience describes something that happened to you yesterday because you identify as a sexual minority woman," with response options ranging from *not at all* (0) to *very much* (6). Sample items include, "I was verbally harassed by someone" and "I was told I was overreacting or being oversensitive regarding sexual minority issues." The responses using the 7-point scale were skewed. Therefore, each item was recoded as *yes* (1) or *no* (0) to reflect whether the participant endorsed the stressor or not. An overall dichotomous (*yes/no*) score was generated to indicate whether participants reported any sexual minority stressors the previous day (i.e., any SMS event). For descriptive purposes, the number of SMS event types was also calculated.

Concealment of Sexual Identity—One concealment question was adapted from the Nebraska Outness Scale (Meidlinger & Hope, 2014) to assess concealment regarding sexual identity during the previous day. Participants were asked, "Yesterday did you avoid talking

about topics related to or otherwise indicating your sexual orientation/identity with..." and could endorse groups such as immediate family, extended family, friends/acquaintances, people at work/school, strangers, or others. Similar to the discrimination item described above, data were coded to reflect whether or not the participant had concealed identity to each potential group and then an overall concealment of score was generated to reflect whether *any* concealment had occurred on the previous day (*yes/no*).

Sexual Minority Discrimination—A single discrimination item was adapted from the Heterosexist Harassment, Rejection, and Discrimination Scale (Szymanski, 2006) that asked, "In thinking about your experiences yesterday, were you rejected or treated unfairly by any of the following people because you identify as a sexual minority woman?" followed by a list of potential individuals (e.g., family members, friends, strangers, teachers, etc.). The data were coded to reflect whether the participant reported rejection or unfair treatment from a particular person or group. For this study, a dichotomous score was generated (*yes/no*) that reflected whether the participant reported any rejection or unfair treatment on the previous day.

Analytic Plan

Multilevel models were conducted using Mplus 8.4 (Muthén & Muthén, 1998–2017). Any global negative SMS, any SMS event (based on the DSMSS), any sexual minority any concealment of sexual identity, and discrimination were separately examined as correlates of same-day (i.e., concurrent associations) and next-day (i.e., lagged associations) alcohol-related outcomes: any alcohol use (*yes/no*), drinking quantity, binge drinking (*yes/no*), and alcohol consequences (*yes/no*). For study aim 1, the full sample was included in the analysis. For aim 2, due to the focus on lagged effects, only participants who completed at least two consecutive daily diary surveys were included ($n = 319$). Robust maximum likelihood estimation or maximum likelihood estimation for first-order derivatives were implemented in models with the continuous drinking quantity outcome and the Bayes estimator was used for models with dichotomous outcomes (i.e., any alcohol use, binge drinking, alcohol consequences). Models for drinking quantity, binge drinking, and alcohol consequences were examined only on days when participants reported drinking. Concurrent associations between the four dichotomous (*yes/no*) stress-related variables (negative global SMS, any SMS event, concealment, discrimination) and the alcohol-related outcomes (alcohol use [*yes/no*], drinking quantity, binge drinking [*yes/no*], alcohol consequences [*yes/no*]) were examined. In addition, time-lagged variables (i.e., $t-1$) were calculated for the daily stress-related variables to assess associations between the SMS predictors and next-day alcohol use behavior; time-lagged models also controlled for the respective drinking outcome variable on the previous day (i.e., the time-lagged alcohol use variable was included as a covariate).

Multilevel models were conducted where Level 1 was the daily observations, Level 2 was participant, and Level 3 was couple. Level 1 variables (daily reports/within-person) were person-mean centered and Level 2 (between-person); although our data were nested at the couple-level, couple-level covariates were not assessed as predictors of participants' daily alcohol use, as such hypothesis tests are outside of the scope of the present study. The tau significance approach was used to examine if slopes should be random versus fixed for all

models; a significant between-couple variance value suggested that random slopes should be used. For the continuous outcome only (i.e., drinking quantity), this approach was also confirmed via deviance testing. A significant deviance statistic between nested models with random vs. fixed slopes suggests that the random slopes should be retained.

Results

Descriptive Information

Participants completed a total of 4,041 daily reports. The compliance rate for the current study was 89.9% (calculated as the number of surveys participants completed out of all possible surveys). At the within-person (daily) level of analysis (i.e., across all possible assessments), participants reported experiencing global negative SMS on 5.21% of the days and at least one SMS event on 19.66% of the days. Additionally, participants reported concealing their sexual identity on 13.51% of the days and sexual minority discrimination on 6.44% of days. At the person-level, across the 14-day study period, 35.85% ($n = 115$) of participants reported experiencing any global negative SMS, 71.03% ($n = 228$) reported at least one SMS event, 51.09% ($n = 164$) reported any concealment, and 33.64% ($n = 108$) reported any discrimination.

For the outcome measures, among the full sample over the 14-day period, alcohol use was reported on 53.96% of days, and participants reported an average of 7.03 drinking days ($SD = 3.47$), 26.52 standard drinks ($SD = 14.57$), and 2.79 ($SD = 2.64$) binge drinking days. Among the full sample, 94.70% ($n = 304$) reported at least one drinking day during the study. Among these drinkers, participants drank an average of 3.05 ($SD = 2.15$) standard drinks on drinking days. Further, among drinkers, 72.70% ($n = 221$) reported at least one alcohol consequence, and 74.67% ($n = 227$) reported at least one binge drinking episode during the study period.

The intraclass correlation coefficient (ICC) for alcohol use (yes/no) was .06, drinking quantity was .05, binge drinking was .05, and alcohol consequences was .14. These values indicate that a large amount of the variance of each alcohol variable (86–95%) is attributed within person.

Concurrent and Lagged Associations Between SMS and Alcohol

Tables 2 and 3 present the concurrent and prospective (i.e., time-lagged) models for stress and alcohol-related associations, respectively. Regarding the concurrent results of within-person effects, on days when participants reported any negative global SMS experiences, any SMS event, or any discrimination, they were more likely to drink on the same day. While substantially lower as compared to within-person effects, there were also several significant between-person effects. Specifically, people who experienced more days with an SMS event during the study period reported consuming more drinks on drinking days and were more likely to experience alcohol consequences on days when they drank. Further, those who reported more days with negative global SMS experiences or discrimination during the study period were more likely to report alcohol consequences on drinking days.

Regarding the time-lagged results, on days when participants experienced an SMS event, they reported consuming more drinks and were more likely to binge drink the following day. There were no other significant time-lagged associations for within-person or between-person effects.

Discussion

Alcohol use disparities among sexual minority women are well documented and more research is necessary to understand the underlying mechanisms contributing to these disparities (see Hughes et al. 2020 for a review). This study aimed to examine associations between experiences of SMS and alcohol-related outcomes among sexual minority women. In particular, we examined concurrent, same-day associations between several measures of daily SMS and drinking outcomes. We also sought to test lagged, next-day associations between sexual minority stress and next-day drinking outcomes. It was expected that daily SMS would be positively related to both concurrent and lagged drinking outcomes.

Consistent with expectations, several measures of SMS were associated with whether a person drank on that day. Specifically, on days when participants reported global negative SMS, an SMS event, or discrimination related to their sexual identity, they were more likely to consume alcohol on those days. The current findings are consistent with previous daily research demonstrating a concurrent association between interpersonal stress and alcohol use (Mohr et al., 2001) and general daily stress and alcohol use (Grzywacz & Almeida, 2008) in general populations (i.e., not sexual minority samples specifically), and among sexual minority men (Mereish et al. 2018). Our results using a daily diary approach extend previous research examining within-person associations over longer time-scales (e.g., months or years). For example, a recent longitudinal study examining other indicators of minority stress among sexual minority women, which found that experiencing more microaggressions related to sexual identity and internalized stigma than usual was associated with an increased likelihood of alcohol use 6 months later (Dyar et al., 2020). When minority stress was conceptualized as victimization related to sexual identity, however, no association with alcohol use was observed, suggesting how SMS is operationalized may result in disparate findings regarding substance use outcomes and that consideration of a range of sexual minority stressors may be necessary to gain a comprehensive understanding of the SMS-drinking relationship.

In the present study, although several measures of SMS were associated with likelihood of alcohol use, none of the daily SMS measures were associated with same-day drinking quantity, likelihood of binge drinking, or alcohol-related consequences. Due to the daily (once per day) assessment of SMS and alcohol use behavior, it is unknown when the person experienced the SMS event in relation to drinking. That is, perhaps the SMS event occurred during the drinking episode but did not influence the amount of alcohol consumed. Regarding alcohol-related consequences, the present results contrast those from a recent study of lesbian and bisexual women in which there was a concurrent association between global negative SMS and alcohol-related consequences (Dyar et al., 2021). One possible explanation for these conflicting findings is that the sample recruited by Dyar et al. (2021) had slightly higher average daily drinking (4.36 drinks) than in the present

sample (3.05 drinks), which could be related to discrepant consequence findings. Another potential explanation is that stressors have a cumulative effect on drinking quantity and alcohol consequences, such that sexual minority stressors “add up” over time, and then contribute to drinking harms. Previous research has found that the accumulation of stressful events throughout the week was associated with increased odds of binge drinking in a general sample (Grzywacz & Almeida, 2008). Our own findings are consistent with these prior findings. The within-person effects observed in the current study suggest that SM stressor events may have a lagged impact on particular drinking behaviors, including consumption amount and harmful drinking likelihood. That is, perhaps SM stressors are not associated with drinking quantity and alcohol consequences within a given day, but over time participants drank more and consequences arose. Thus, timing of the SMS events and type of drinking outcome would be important to consider in future research as impact of SMS may differ for same-day versus next-day across different indicators of consumption. Replication of these findings are needed to further unpack exactly when and how SMS experiences may impact various drinking behaviors among sexual minority groups over time.

Several indicators of SMS were associated with next-day drinking quantity and risky drinking. Specifically, on days when an SMS event was reported, participants drank more and were more likely to engage in binge drinking the following day (as compared to days without an SMS event). These findings demonstrate that experiencing even one SMS event is associated with more drinking and risky drinking the following day and emphasizes the potential strong and lasting impact that these unique stressors can have on sexual minority women’s alcohol use. There were no prospective associations between any measures of SMS and likelihood of alcohol use or alcohol-related consequences. These results regarding consequences are consistent with the Dyar et al (2021) study, which also found no association between global SMS and alcohol consequences the following day.

The current findings add to the growing body of literature suggesting that SMS may be a critical factor to consider in understanding the disparities in alcohol use and associated problems between heterosexual and sexual minority women. Some of the current results are similar with a previous daily study of SMS and alcohol among sexual minority women, but it is worth commenting on the differences. For example, Dyar et al. (2021) did not find a lagged effect for SMS and drinking quantity. They raised the question of whether a day long lag between reports may be too long to see changes in alcohol use related to minority stress. Our results suggest that depending on how alcohol use and SMS are measured, these association may emerge. In the current study there were no lagged effects when SMS was assessed with a single general item about negative experiences related to sexual orientation (similar to the item used by Dyar et al., 2021). Rather, significant lagged effects for quantity and binge drinking emerged when SMS was assessed with a multi-item measure assessing specific SMS events. Perhaps these multiple items provided greater specificity and encouraged participants to think differently about their experiences as they are asked to consider a number of possible stressors versus a global experience.

Contrary to expectations, SMS was not associated with same-day or next day alcohol consequences at the daily level. Our findings differ from a recent daily diary study in which

sexual minority women reported more alcohol-related consequences on days when they experienced more SMS (Dyar et al., 2021). As in Dyar et al. (2021), however, we did not find a lagged effect for alcohol consequences. One explanation for these disparate findings is differences in the samples. In the current study most (94%) of the participants reported mostly or exclusive attraction to women and were in a relationship with another woman. In Dyar et al. (2021) participants were assigned female at birth, and the sample included a small number of transgender men and presumably a large number of women who identified as bisexual (they report 40% of the sample identified as lesbian). In the current study, over 80% of the sample identified as lesbian with only 20% identifying as bisexual. Since bisexual women drink more (e.g., Gonzales et al., 2016) and drinking was greater in Dyar et al. (2021), perhaps more drinking was then associated with more consequences. It is also possible that participants in our sample benefitted from the protective effects of being in a relationship, resulting in less alcohol use to cope with negative affect.

The current study employed a daily diary design to capture sexual minority women's SMS experiences and alcohol use in real life, and thus, although not a primary study aim, can provide data regarding daily diary compliance and occurrence of SMS and drinking in a sample of sexual minority women that may help inform future research particularly given the lack of daily studies in this area. Compliance with daily reporting was excellent. In addition, in designing the study we recognized that when sampling over a 2-week period it is important that participants report sufficient occurrences of the variables of interest. Therefore, one member of each couple was recruited based on inclusion criteria of at least 3 drinking days and one binge episode in a two-week period prior to study entry to ensure sufficient alcohol use would occur during the study period. Although only one partner needed to meet this alcohol use criterion, it is noteworthy that almost 95% of the participants reported drinking on at least one day during the study period. Participants reported using alcohol on about half of the days during the study period and an average of 3.05 drinks per day. Participants also reported binge drinking on approximately one-third of the days and reported alcohol consequences on slightly more than one-quarter of the days. Regarding sexual minority stress, participants reported experiencing at least one SMS event on nearly 20% of the days in the 2-week study period. Using the Daily Sexual Minority Stress Scale (DSMSS; Heron et al., 2018) allowed us to capture SMS events by providing participants with a list of several specific stressors. Consistent with previous research (e.g., Dyar et al., 2021; Mohr & Sarno, 2016), we also measured global negative SMS experiences using a single general item, and in the present study participants less frequently endorsed experiencing SMS when using this single general item (~5% of days). Therefore, the DSMSS may be a more accurate measure to capture a wide range of SMS experiences relative to a single item. Participants also reported concealing their sexual identity on approximately 14% of the days and discrimination on 6% of the days. Descriptive analyses revealed approximately three-quarters of the participants reported at least one day of SMS (via the DSMSS) and approximately one-third of participants reported at least one day of global negative SMS experience during the study period. Approximately one-third of the participants reported at least one experience of sexual minority discrimination and one half of the participants reported at least one experience of concealment of sexual identity during

the study period. Taken together, it appears that our participants reported sufficient levels of SMS and alcohol use to permit examination of these experiences in daily life.

Limitations and Future Directions

Despite the important findings that emerged from this study, several limitations exist, highlighting areas for future research. Participants in this study were mostly White, well educated, and tended to be open about their sexual identity. How the current findings extend to racially/ethnically diverse samples, those with other gender identities (i.e., not cisgender women), or who have different relationship statuses (e.g., not in a relationship, in a relationship with a man or individual who identifies as non-binary or gender queer) requires further investigation. Sexual minority women with additional minority identities may experience additional stressors (e.g., racial/ethnic microaggressions) that were not captured in the current research. Future research is also needed to explore how holding intersecting identities (sexual identity, gender identity, racial/ethnic identity) is related to experiencing specific types of minority stressors, and how these in turn may be associated with substance use and other maladaptive health behaviors.

The current study employed a daily diary design in which participants reported on the previous day's experiences. This study was non-experimental and therefore for the concurrent analyses presented we cannot determine the direction of effects. In other words, the association between SMS and drinking may reflect drinking to cope with SMS or drinking creating more SMS. Although the lagged analyses somewhat address this concern, as discussed previously, day lags may not be optimal for detecting associations between SMS and alcohol use outcomes, as these processes may occur either over much shorter timeframes (i.e., minutes or hours) or much longer timeframes (i.e., multiple days or weeks). For example, sexual minority women may experience SMS during a drinking event which in turn contributes to more drinking or alcohol consequences during that current drinking episode. In this example, an EMA design with multiple assessments within the day (cf. Livingston et al., 2017) could provide a more fine-grained assessment of how minority stress is associated with alcohol use and to clarify the temporality of the association between stress and drinking (e.g., does SMS experienced early in the day relate to drinking later that night?), as well as whether their impact may be bi-directional (e.g., SMS related to later drinking but drinking may promote SMS later in the day). An EMA design also would permit examination of other direct antecedents (contextual factors such as mood/affect, interpersonal conflict, etc.) that may have preceded the specific drinking episode. However, it is also possible that the association between SMS and drinking is a process that unfolds over days and/or weeks. Research questions regarding these processes could be tested by examining multiple lagged days and/or considering whether there are day-level cascading processes occurring across multiple days. The optimal timeframe (e.g., within day vs. over days or weeks) for assessing how these factors relate remains an important empirical question that should be explored in future research.

Additionally, our findings indicate that the association between SMS events and alcohol outcomes is better accounted for at the within-person rather than between-person level. In other words, it is not necessarily that those who experience more SMS in general are more

likely to drink, but rather, when an individual experiences more SMS relative to their own typical levels of SMS experiences, they are more likely to engage in any drinking that same day or more risky drinking behaviors the next day. Future research would benefit from continued emphasis on within-person processes and understanding how these processes unfold over time for sexual minority individuals.

In the present study, drinking data were based on self-reports that were not verified through other methods; however, daily diary methods have been supported to provide valid drinking data (Patrick & Lee, 2010). This study also focused only on alcohol use, not other substances. The degree to which these findings generalize to other substances and risky use behaviors (e.g., polysubstance use) is an important area of future investigation. Much less is known about disparities in other substance use among sexual minority women and future work is needed to understand how SMS may be associated with other substance use (including dual- and multi-substance use) for sexual minority individuals.

Assessing SMS at the daily level is challenging. Our results suggest that how SMS is assessed is an important consideration for future research. Single item measures of global negative SMS, concealment, and discrimination yielded different associations with alcohol use compared to a multi-item measure of SMS events in which participants endorsed whether they experienced specific sexual minority stressors. The current study used a dichotomous measure of SMS due to the overabundance of zero values. Continuous measures of SMS could inform whether the number of SMS experiences influences alcohol use. Future research will benefit from assessing SMS in multiple ways to fully capture participants' daily experiences.

Another important consideration with assessing SMS involves differentiating between the occurrence of stressors and perceptions or salience of the stressors. For example, in developing a measure to retrospectively assess minority stress, Balsam et al. (2013) suggested that responses can be categorized in terms of whether or not an experience occurred as well as the degree of distress experienced. In the current study we assessed *whether* something occurred but not the *perception* of the severity of the experience. The perceived severity of the SMS experience may also impact alcohol use. That is, some individuals may interpret SMS experiences more negatively or more salient than others which may result in greater alcohol use. Future research could examine SMS and perceived harm/distress of the SMS experience.

It is also important for future research to examine factors that mediate or moderate the association between SMS and alcohol use. For example, one recent study revealed that coping efficacy and social anxiety mediated the concurrent association between minority stress and alcohol consequences (Dyar et al., 2021). Other potential moderators or mediators that could be examined include negative affect and drinking to cope. It is possible that the degree of association between SMS and drinking is dependent on one's affective state and the strategy employed to cope with a negative emotional state. It is also possible that SMS is associated with next day drinking as a way to cope with elevated stress. Better understanding of the mechanisms of how minority stress is associated with alcohol use is an important area for future research.

Conclusion

A recent National Academies of Sciences, Engineering, and Medicine (2020) report notes the central role that minority stress plays in disparities among sexual minority groups and encourages the development of evidence-based interventions to prevent and reduce health disparities among sexual and gender minority populations. Our results demonstrate the importance of addressing SMS experiences, as they are associated concurrently with same day alcohol use and prospectively with next day drinking quantity and binge drinking. The current findings suggest that culturally-tailored interventions to reduce harmful drinking in sexual minority women should consider the role that unique stressors related to stigmatization and marginalization play in alcohol use and related harms.

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Public Significance Statement

This study suggests that, among sexual minority women, experiences of discrimination or marginalization related to being a sexual minority are associated with indices of drinking, including risky drinking. Specifically, sexual minority stressors were associated with an increased likelihood of same-day drinking, as well as increased drinking and likelihood of binge drinking the following day. Sexual minority stress may help explain the disparities in alcohol use for sexual minority women.

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Table 1

Demographic Characteristics

	<i>M (SD) or n (%)</i>
Age	27.56 (3.67)
Relationship Length (Months)	40.95 (31.37)
Live with Partner (Yes)	242 (75.63%)
Ethnicity	
Hispanic, Latina, or Spanish Origin	37 (11.53%)
Not of Hispanic, Latina, or Spanish Origin	284 (88.47%)
Race	
White	230 (71.65%)
Multiracial	33 (10.28%)
African American or Black	27 (8.41%)
Asian, Asian American, Native Hawaiian, or Pacific Islander	19 (5.92%)
Other Race	10 (3.12%)
American Indian and Alaska Native	2 (0.62%)
Education Level	
Some High School	3 (0.93%)
High School Graduate	20 (6.23%)
Some College	45 (14.02%)
Associate's Degree	16 (4.98%)
Bachelor's Degree	155 (48.29%)
Master's Degree	66 (20.56%)
Doctoral/Professional Degree	16 (4.98%)
Sexual Identity ^a	
Lesbian	269 (83.80%)
Queer	121 (37.69%)
Gay	98 (30.53%)
Bisexual	66 (20.56%)
Pansexual	17 (5.30%)
Asexual	2 (0.62%)
Other	2 (0.62%)
Questioning	1 (0.31%)
Sexual Attraction	
Only Women	145 (45.31%)
Mostly Women	157 (49.06%)
Equally Women and Men	17 (5.31%)
Mostly Men	1 (0.31%)
Only Men	0 (0%)
Sexual History (Past Year)	
Women Only	300 (93.46%)
Women and Men	20 (6.23%)

	<i>M (SD) or n (%)</i>
Men Only	0 (0%)
No One	1 (0.31%)
Outness	
Definitely in the closet	0 (0%)
In the closet most of the time	0 (0%)
Half in and half out	15 (4.67%)
Out of the closet most of the time	93 (28.97%)
Completely out of the closet	213 (66.36%)

Note. *N* = 321.

^a indicates that groups are not mutually exclusive.

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Table 2

Concurrent Associations

	Within-Person		Between-Person	
	<i>b(SE) / b(posterior SD)</i>	<i>p</i> or 95% CI	<i>b(SE) / b(posterior SD)</i>	<i>p</i> or 95% CI
Alcohol Use (yes/no)				
Global Negative SMS	0.341 (0.148)	0.049, 0.629	-0.011 (0.490)	-0.887, 0.997
SMS Event	0.193 (0.075)	0.031, 0.334	0.209 (0.188)	-0.125, 0.578
Concealment	0.083 (0.102)	-0.120, 0.274	-0.110 (0.240)	-0.493, 0.435
Discrimination	0.380 (0.139)	0.098, 0.638	-0.462 (0.396)	-1.283, 0.272
Drinking Quantity				
Global Negative SMS	0.161 (0.228)	.481	0.397 (0.834)	.635
SMS Event	0.076 (0.122)	.531	0.669 (0.297)	.024
Concealment	-0.253 (0.176)	.152	0.003 (0.344)	.993
Discrimination	0.176 (0.234)	.452	0.545 (0.747)	.466
Binge Drinking (yes/no)				
Global Negative SMS	0.065 (0.205)	-0.373, 0.430	-0.277 (0.706)	-1.565, 1.282
SMS Event	0.005 (0.131)	-0.280, 0.237	0.199 (0.253)	-0.290, 0.689
Concealment	-0.195 (0.156)	-0.491, 0.073	-0.369 (0.310)	-1.002, 0.303
Discrimination	0.265 (0.205)	-0.288, 0.570	0.278 (0.293)	-0.247, 0.834
Alcohol Consequences (yes/no)				
Global Negative SMS	-0.041 (0.175)	-0.392, 0.265	1.489 (0.693)	0.298, 3.213
SMS Event	0.177 (0.103)	-0.012, 0.382	0.996 (0.237)	0.536, 1.456
Concealment	0.110 (0.168)	-0.202, 0.433	0.754 (0.314)	-0.036, 1.310
Discrimination	-0.069 (0.236)	-0.567, 0.341	1.701 (0.601)	0.605 (3.151)

Note. SMS = Sexual Minority Stress.

Drinking quantity, binge drinking, and alcohol consequences were only assessed on drinking days.

Table 3

Time-Lagged Associations

	Within-Person		Between-Person	
	<i>b(SE) / b(posterior SD)</i>	<i>p</i> or 95% CI	<i>b(SE) / b(posterior SD)</i>	<i>p</i> or 95% CI
Alcohol Use (yes/no)				
Global Negative SMS	-0.009 (0.145)	-0.317, 0.260	0.062 (0.253)	-0.461, 0.602
SMS Event	0.024 (0.088)	-0.139, 0.201	0.001 (0.112)	-0.227, 0.190
Concealment	0.055 (0.108)	-0.158, 0.268	-0.068 (0.111)	-0.280, 0.145
Discrimination	0.129 (0.173)	-0.213, 0.484	-0.012 (0.154)	-0.314, 0.300
Drinking Quantity				
Global Negative SMS	-0.126 (0.407)	.757	-0.261 (0.977)	.790
SMS Event	0.542 (0.234)	.020	-0.273 (0.321)	.395
Concealment	0.193 (0.343)	.575	-0.061 (0.501)	.903
Discrimination	-0.439 (0.398)	.270	0.046 (0.831)	.956
Binge Drinking (yes/no)				
Global Negative SMS	0.095 (0.397)	-0.739, 0.841	0.098 (0.629)	-1.138, 1.140
SMS Event	0.601 (0.198)	0.187, 0.962	-0.055 (0.224)	-0.583, 0.290
Concealment	0.006 (0.249)	-0.413, 0.561	-0.041 (0.252)	-0.568, 0.377
Discrimination	-0.072 (0.380)	-0.868, 0.622	0.259 (0.468)	-0.672, 1.143
Alcohol Consequences (yes/no)				
Global Negative SMS	-0.317 (0.534)	-1.353, 0.799	0.159 (0.531)	-0.902, 1.146
SMS Event	0.170 (0.235)	-0.176, 0.701	-0.071 (0.224)	-0.566, 0.318
Concealment	0.154 (0.267)	-0.334, 0.677	-0.085 (0.259)	-0.555, 0.424
Discrimination	-0.064 (0.543)	-1.072, 1.011	0.085 (0.401)	-0.738, 0.880

Note. SMS = Sexual Minority Stress.

Drinking quantity, binge drinking, and alcohol consequences were only assessed on drinking days.