Published in final edited form as:

Behav Med. 2018 ; 44(2): 123–130. doi:10.1080/08964289.2017.1282853.

Psychosocial obstacles to smoking cessation attempts among young adult sexual minority women who smoke

Jose A. Bauermeister, MPH, PhD¹, Emily J. Youatt, MPH, PhD², Emily S. Pingel, MPH³, Jorge H. Soler, MPH, PhD², and Michelle M. Johns, MPH, PhD²

¹Department of Family and Community Health, University of Pennsylvania School of Nursing, Philadelphia, PA

²Center for Sexuality & Health Disparities, University of Michigan, Ann Arbor, MI

³Department of Sociology, Emory University, Atlanta, GA

Abstract

Sexual minority women (SMW; i.e., women who identify their sexuality as lesbian, bisexual, or something other than heterosexual) report greater smoking behaviors than their heterosexual counterparts across all ages. We conducted a multivariable regression to examine the correlates of prior smoking cessation attempts and smoking cessation intentions in a sample of young SMW who smoke ($N=338$; ages 18–24). Covariates included sociodemographic characteristics (i.e., race/ethnicity, sexual identity, age, urbanity), general (i.e., perceived stress) and sexuality-specific (i.e., internalized homophobia) stressors, as well as smoking attitudes and subjective norms. Bisexual women (OR=1.92, 95% CI: 1.11, 3.31) were more likely than lesbian counterparts to report a prior smoking cessation attempt. Prior cessation attempts were associated with less internalized homophobia (OR=.44, 95% CI: .27, .69) and positive attitudes towards smoking (OR=2.17, 95% CI: 1.27, 3.70). Smoking cessation intentions in the next month were negatively associated with being a daily smoker ($\beta=-.14$) and attitudes towards smoking ($\beta=-.19$). Based on these findings, we underscore the need to address the risk correlates associated with SMW's quit attempts and include these in cessation interventions.

Keywords

tobacco; quit; lesbian; bisexual; young adulthood

INTRODUCTION

Smoking is the leading preventable cause of death in the United States. While smoking has declined by half over the past few decades in response to a variety of programs and policies, approximately 18% of all adults ages 18 years or older in the United States (42 million) smoke¹. The smoking rate among sexual minorities is twice that of the general population².

Corresponding Author: Jose A. Bauermeister, MPH, PhD, bjose@upenn.edu, School of Nursing, University of Pennsylvania, 418 Curie Blvd, Suite 402, Philadelphia, PA 19104. bjose@upenn.edu, youatt@umich.edu, emily.sweetnam.pingel@emory.edu, jhsoler@umich.edu, johnsmm@umich.edu.

This disparity is even greater when gender and age are considered^{2–3}. Sexual minority women (SMW; i.e., women who identify their sexuality as lesbian, bisexual, queer or something other than heterosexual) report similar smoking rates than their sexual male counterparts, yet are more likely to smoke than their heterosexual female counterparts^{1,4–5}. In a recent secondary data analysis of the CDC’s National Adult Tobacco Survey, sexual minority women reported fewer smoking cessation attempts than heterosexual counterparts, yet did not differ in their desire to quit smoking⁶. At present, however, available data on the correlates of smoking cessation among *young adult* sexual minority women (YSMW) are limited. Mounting evidence suggests that SMW young adults (ages 18–24 years old) are more likely to smoke at increased frequency and quantity than older SMW counterparts⁴, and are more likely to be the target of tobacco companies’ marketing efforts^{7–9}. In light of these findings, this study builds on the American Lung Association’s call² for the development of “promising innovations and interventions to prevent tobacco use and promote quitting” for sexual and gender minority populations.

The Integrated Behavioral Model¹⁰ synthesizes constructs from several theories of behavior change and acknowledges that behaviors are predicted by individuals’ attitudes and norms regarding the behavior, their intentions and confidence to perform the behavior, as well as the salience (e.g., frequency) and habits embedded in the behavior being changed. Support for these constructs has been documented in both the general population^{11–12} and among sexual minority samples^{13–14}. Alongside these psychosocial correlates, researchers have also underscored the importance of examining the extent to which smokers feel capable of managing stress in their lives. In prior studies, smokers’ ability to cope with stress has been a strong predictor of smoking cessation outcomes^{15–18}. In light of these prior findings, we examine sought to examine the contribution of psychosocial correlates of behavior (e.g., attitudes, norms, habits) and experiences of general stress (e.g., perceived stress) on YSMW’s prior smoking cessation and future smoking cessation intentions.

Sexual minority stress may cause unique and additive stress that affect the well-being of sexual and gender minority populations¹⁹. For example, SMW may experience additional stressors associated with their sexuality (e.g., social stigma and internalized homophobia) that may reduce their ability to quit smoking^{19–21}. In qualitative work, researchers have repeatedly found that internalized homophobia and experiences of stigma are unique, additive factors that hinder SMW’s ability to quit smoking^{21–22}. The impact of sexual minority stress might be pronounced for YSMW given their developmental timing, as young women may still be developing the psychosocial coping strategies and resources required to navigate the social stigma associated with being a sexual minority^{23–24}.

The goal of this cross-sectional descriptive study was to examine the psychosocial barriers and facilitators associated with YSMW’s smoking cessation attempts, as measured by retrospective behavior (i.e., prior quit attempts in the prior year) and future behavior (i.e., behavioral intentions to quit in the next month). Consistent with the prior smoking literature, we hypothesized that YSMW with greater endorsement of attitudes and subjective norms towards smoking would report fewer attempts to quit smoking. We also hypothesized that YSMW reporting greater generalized and sexuality-specific stress would be less likely to report engaging in smoking cessation attempts.

METHODS

Sample

We conducted the current study using data from a cross-sectional, observational study examining YSMW and their smoking behaviors²⁵. To be eligible for participation, recruits had to be cisgender, between the ages of 18 and 24, note that their state of residence was Michigan, and either identify as something other than heterosexual *or* have had sexual experiences with a woman in the past year. We recruited participants through advertisements on Facebook. This site allowed us to tailor study advertisements to only appear to women who fit the eligible age range, listed themselves as residing in Michigan, and marked themselves as interested in relationships with women. All promotional materials displayed a synopsis of eligibility criteria, a mention of a \$25 electronic gift card incentive, and the survey's website.

We recruited 471 participants who met study criteria (blinded for review). Fifty-five percent of women in this sample identified as lesbian, 33% as bisexual, and 13% as some other identity (i.e., queer, pansexual, no label, heterosexual). Seventy percent of the sample identified their race or ethnicity as White/ European-American, 11% identified as Black/ African American, 6% as Latino/ Hispanic, and 12% identified as some other racial category. We asked women to characterize the area or neighborhood in which they lived—54% said they lived in an urban environment, 25% said suburban, 19% said rural, and 3% said other. Women in this study ranged in age from 18 to 24 with a mean age of 21.41. In terms of smoking behaviors, 25% of our sample identified as everyday smokers, 51% said they smoked some days, and 24% said they never smoked. Of the smokers ($n=360$), 77% percent said they smoked five or more cigarettes a day (i.e., bingers), while 23% said they smoked less than five cigarettes a day (i.e., chippers). Given the focus on smoking cessation correlates, we excluded non-smokers from our analysis (see Table 1 for demographic characteristics of our sub-sample of smokers).

Of the 364 smokers in our sample, 26 participants (7.1%) had missing data in at least one of our variables of interest, leading to their removal prior to our analyses. Our attrition analyses found no statistical differences between those retained and those with missing data across age, educational attainment, sexual orientation, race/ethnicity, smoking frequency, prior quitting intention, quit intention in the next month, quitting-related social support, or internalized homophobia. Compared to those retained in the analysis ($M=2.99$, $SD=.53$), participants with missing data were less likely to perceive smoking as a coping resource ($M=2.70$, $SD=.58$; $t_{(362)}=2.70$, $p<.01$).

Procedures

Study data were protected with a 128-bit SSL encryption and kept within a firewalled server. Upon entering the study site, participants were asked to enter a valid and private email address, which served as their survey username. This allowed participants to save their answers and complete their survey in more than one sitting if necessary. Participants were asked eight questions to determine their eligibility. If eligible, participants read a detailed consent form that explained the purpose of the study (i.e., exploring how YSMW choose

whether or not to smoke cigarettes) and their rights as participants. YSMW were asked to acknowledge that they read and understood each section of the consent form (i.e., participation involvement, protection of privacy, uses of data, potential benefit, compensation, terms of the Certificate of Confidentiality, and who to contact if they had questions). Consented participants completed a 45 to 60 minute online survey covering topics such sociodemographic characteristics, smoking attitudes and behaviors, alcohol and drug (AOD) use, sexuality, discrimination, and psychosocial wellbeing. We removed duplicates and falsified entries by examining participants' email and IP addresses from the final sample. A Certificate of Confidentiality protected study data. The Institutional Review Board of the University of Michigan approved all study procedures.

Measures

Smoking.—Survey respondents answered several questions about their smoking behaviors. We asked women, “Do you now smoke cigarettes every day, some days, or not at all?” From how participants answered this question, we categorized women as either *smokers* (i.e., every day, some days) or *non-smokers* (i.e., not at all). In the subsequent analyses focused on smokers, we further differentiated between participants as those who smoked daily or some days. In multivariable analyses, participants who did not smoke daily served as the referent group.

Past Year Quitting Behavior.—We asked participants who reported being current smokers whether they had attempted to quit in the prior year (i.e., During the past 12 months, have you stopped smoking for one day or longer because you were trying to quit smoking?). Participants who answered “No” to this question served as the referent category in multivariable analyses.

Smoking Cessation Intentions.—We asked participants to note their likelihood to quit smoking in the next month on a scale from 1 (Extremely Unlikely) to 6 (Extremely Likely). Two items were used: “I intend to smoke cigarettes in the next month” and “I will try to smoke cigarettes in the next month”. Given the stigma associated with smoking behaviors, we positively worded these items to reduce social desirability. We reverse scored the items and created a mean composite score, where higher scores indicate greater smoking cessation intentions ($\alpha = .89$).

Attitudes toward Smoking.—We used the psychoactive benefits subscale of the Attitudes Towards Smoking Scale²⁶ to assess participants' agreement with four items regarding the psychoactive benefits of smoking: “A cigarette calms me down when I am stressed”, “Smoking calms me down when I am upset”, “A cigarette helps me deal with difficult situations”, and “After a cigarette, I am able to concentrate better”. Participants answered each item using a 4-point scale (1=Totally Disagree; 4=Totally Agree). We created a mean composite score, where higher scores indicated greater endorsement of positive attitudes toward smoking ($\alpha = .72$).

Subjective Norms.—We ascertained participants' perceptions regarding whether their social network would be supportive of their decision to quit smoking using the 6-item

Important Other Climate Questionnaire for Smoking scale²⁷. Participants answered these six items (e.g., “My support system conveys confidence in my ability to make changes regarding my smoking or quitting”, “My support system tries to understand how I see smoking before suggesting any changes”) on a 6-point scale (1=Strongly Disagree; 6=Strongly Agree). We created a mean composite score ($\alpha = .81$), where higher scores indicated stronger subjective norms towards smoking cessation.

Perceived Stress.—We used a 5-item perceived stress scale²⁸ that asked participants about experiences of stress over the past month (e.g. “how often have you found that you could not deal with all the things that you had to do?” and “how often have you been upset because of something that happened that you didn’t expect?”) on a scale from 1 (Never) to 5 (Very often). We created a mean composite score for use as a predictor ($\alpha = .75$), where higher values signified higher levels of stress.

Internalized Homophobia.—We used a 9-item measure of internalized homophobia²⁹ to ascertain participants’ negative perceptions of their sexuality using a 4-point scale (1=Strongly Disagree; 4=Strongly Agree). Items were mean scored to create a composite measure ($\alpha = .90$), where higher values indicated higher internalized homophobia.

Demographics.—We asked participants a series of questions about the sociodemographic characteristics, including their age, sexual identity, race/ethnicity, urbanity, and educational attainment (see Table 1). For the purposes of this analysis, we grouped women into three categories: lesbians, bisexual women, and women with other sexual identities. In all analyses, lesbians served as the referent group. Similarly, we treated race/ethnicity as dummy variable with White/European-American as the referent group given the small proportion of women identifying as racial/ethnic minorities. Educational attainment was not included in our multivariable models as its inclusion in the multivariable models created multicollinearity with age.

Data Analytic Strategy

After examining the characteristics of our sample using descriptive statistics (see Table 1), we employed a multivariable logistic regression (see Table 2) to examine whether sociodemographic characteristics (e.g., age, race/ethnicity, sexual identity, and urbanity), smoking frequency, attitudes and norms regarding smoking, and perceived stress and internalized homophobia were associated with YSMW’s smoking cessation attempts in the prior 12 months. Subsequently, we examined whether these variables were associated with participants’ smoking cessation intentions in the next month using a multivariable linear regression (see Table 3). We included prior smoking cessation attempts as a covariate in this linear regression analysis, as research has noted that prior behavior is associated with behavioral intentions.

RESULTS

Sample Description

Our sample's mean age was 21.6 years old ($SD=1.66$; see Table 1). The majority of our sample was White (67.2%). Within our sample, 60% of our sample identified as lesbian, 32% identified as bisexual and 7% reported primarily identifying with another sexual identity (e.g., queer, pansexual, no label). Most participants reported having more than a high school degree. Two-thirds of the sample reported smoking on some days (66.3%) rather than daily (33.7%). Close to half of SMW (46.4%) reported having attempted to a smoking cessation attempt in the prior year.

Prior Smoking Cessations Attempts

In our logistic regression model ($\chi^2_{(11)}=79.08$, $p<.001$; Nagelkerke $R^2=28\%$), YSMW who reported prior smoking cessation attempts indicated greater positive attitudes towards smoking ($OR=2.17$ [95% CI: 1.27, 3.70]; $p<.01$) and reported less internalized homophobia ($OR=.44$ [95% CI: .27, .69]; $p<.001$). Bisexual women had greater odds of smoking cessation attempts than lesbians ($OR=1.92$ [95% CI: 1.11, 3.31]; $p<.05$). We observed no association between smoking cessation attempts and smoking frequency, perceived stress, subjective norms, or other sociodemographic characteristics (see Table 2).

Smoking Cessation Intentions

In our linear regression model ($F_{(12,325)}=3.53$, $p<.001$; $R^2=8\%$), we found that smoking cessation intentions in the next month were associated with prior quit attempts ($b=.25$, $SE=.12$; $\beta=.12$; $p<.05$). Smoking cessation intentions were lower among daily smokers ($b=-.30$, $SE=.13$; $\beta=-.14$; $p<.05$) and with positive attitudes towards smoking ($b=-.38$, $SE=.12$; $\beta=-.19$; $p<.001$). We observed no relationship between smoking cessation intentions and internalized homophobia, perceived stress, subjective norms towards smoking, or the sociodemographic characteristics (see Table 3).

DISCUSSION

Development of successful smoking cessation programs are needed given the known health risks associated with smoking. Given that smoking cessation programs focused on the general population may lack sufficient specificity to address the specific needs of SMW, the American Lung Association² has encouraged the recognition of YSMW as a priority population and called for the development of research and interventions that reduce smoking behaviors in this group. Therefore, we sought to examine the psychosocial correlates associated with YSMW's smoking cessation attempts, as measured by retrospective behavior (i.e., prior smoking cessation attempts in the prior year) and future behavior (i.e., smoking cessation intentions in the next month), in this study.

Nearly half of YSMW in our sample reported smoking cessation attempts in the prior year. Prior quit attempts were associated with greater behavioral intentions to quit smoking. This finding is consistent with prior research suggesting that the best predictor of future behavior is prior behavior³⁰. Furthermore, YSMW who endorsed greater attitudes regarding the

psychoactive benefits of smoking were more likely to report smoking cessation attempts in the past. Given that our attitudinal measure of smoking focused on the psychoactive benefits attributed to smoking (e.g., smoking helps me relax), these associations might signify greater awareness about the role that cigarettes play in their lives among smokers who have attempted to quit smoking or are thinking about quitting in the near future. In fact, prior intervention research focused on smoking cessation posits that smokers must be mindful and continually monitor the psychosocial circumstances (e.g., feeling stressed) that trigger a need to smoke³¹. At the same time, however, positive attitudes towards smoking were negatively associated with SMW's smoking cessation intentions. We see two potential reasons for these opposite associations between attitudes towards smoking and our smoking cessation outcomes. First, it is possible that SMW's attitudes towards the benefits of smoking outweigh the unforeseeable benefits of changing their behavior, thus reducing their smoking cessation intentions. Second, building on trans-theoretical models of change (e.g., Stages of Change), it is possible that our participants are in the contemplation stage; thus, while they are aware of the issue, they are not motivated enough to change their behavior³². Our findings align with the psychosocial processes underlying the stages of change models, whereby individuals' motivations to change behavior over time diminish when there are failed attempts at the behavior. Unfortunately, given the cross-sectional nature of our study, it is impossible to ascertain the causal order of these relationships. Future research exploring how attitudes towards smoking affects YSMW's smoking cessation behavior change over time is warranted.

Participants who smoked daily were less likely to intend to quit smoking in the next months. Given the frequency of their smoking habits, daily smokers might have a greater propensity to experience nicotine addiction and dependence than smokers who smoke less frequently. Prior biopsychosocial research has noted that smoking cessation success among smokers who rely more actively on nicotine have lower motivations to quit⁶. Unfortunately, we were unable to examine level of nicotine dependence and physiologic stress to test this proposed pathway. Future research that examines physiologic biomarkers and psychosocial processes concurrently as predictors of YSMW's smoking cessation is warranted.

Smoking cessation attempts were less likely among YSMW who reported greater internalized homophobia. Although theoretically posited to be associated with smoking cessation, our measure of perceived stress was not associated with smoking cessation attempts or intentions. The absence of an association between perceived stress and our smoking cessation outcomes is noteworthy given the salience of stress reduction activities in smoking cessation interventions^{2,33–34}. It is also possible that, compared to heterosexual populations, YSMW's sexuality-related stress are more central to smoking decisions than constructs assessing generalized stress. Thus, consistent with prior research, our findings reinforce the notion that SMW experience added stress due to sexuality-related stigma. Taken together, we underscore the importance of including strategies to help young women reduce and resolve feelings of internalized homophobia, as well as potential cope with sexuality-related stigma, as part of smoking cessation programs^{15,22,33}.

Lesbian women were less likely than bisexual peers to have attempted to quit smoking in the prior year; however, they did not differ in their smoking cessation intentions. These results

contrast prior findings by Fallin and colleagues⁶, where lesbian smokers indicated greater smoking cessation intentions and attempts than bisexual counterparts. One potential reason for the inconsistency between our findings may be attributable to sample characteristics. Whereas Fallin et al.'s study recruited a national sample of adults, we focused our sampling to YSMW in a very narrow age range. Given the variability of smoking across the life course^{1,35}, it is possible that YSMW's characterization of their sexual identity, as well as their motivations to quit smoking, may differ from their older peers. Future research examining why lesbian and bisexual women differ in their smoking cessation attempts is warranted, as it may help address the existing disparity in smoking rates between these two groups.

We observed no association between subjective norms and smoking cessation attempts or smoking cessation intentions in our multivariable analyses. Although our subjective norm construct had strong internal consistency and has been used in prior smoking studies, it is possible that other network-based components (e.g., social support, descriptive norms regarding smoking) might be better predictors of smoking cessation attempts. In a sample of sexual minority youth, for example, Rosario and colleagues³⁶ found that general social support buffered the relationship between smoking and psychological distress, with greater availability of social support being associated with greater reductions in psychological distress among smokers. Similarly, Johns and colleagues²⁵ noted that YSMW were less likely to smoke every day if they reported greater social support in their social networks. Taken together, these findings underscore the importance of considering how other network-based constructs might be associated with the smoking habits of YSMW.

While this study contributes to our understanding of YSMW's smoking cessation attempts, several limitations should be noted. First, given the cross-sectional design of our observational study, we are unable to test causal pathways around smoking cessation behaviors. Additionally, our current survey relied on self-report data on the smoking behaviors of YSMW. Self-report data may underestimate cigarette use³⁷; however, this methodology is consistent with other research studies on tobacco among SMW. Moving forward, research in this area may wish to include both biological and behavioral indicators of nicotine dependence to extend our understanding of the smoking patterns of YSMW. Additional exploration on other tobacco products (e.g., e-cigarettes, hookah) may be warranted given their increased use. Furthermore, we utilized a web-based, convenience sampling strategy, and thus our findings are not generalizable to the whole of YSMW; however, we believe that the insights into the relationships between smoking cessation attempts and stress in our sample provide invaluable foundational information for smoking cessation programs. Future research that replicates and extends our analyses with representative samples of YSMW are needed. Finally, we used measures that have been previously validated with heterosexual populations. While these scales had adequate internal consistency, it remains unclear whether these scales need to be adapted and refined for sexual and gender minority populations. Future mixed methods research, including the testing and appropriate adaptation of these measures, may be warranted.

CONCLUSIONS

The results of this study may be useful in developing smoking cessation programs for YSMW. Practitioners working with YSMW smokers to help them quit smoking may need to purposefully address sexuality-specific stressors in their intervention content and provide opportunities for YSMW to address and/or learn to cope with sexuality-specific stressors. Given the high proportion of participants who reported attempting a prior quit attempt, materials may also benefit from emphasizing the iterative nature of quitting smoking and provide encouragement to YSMW who may feel frustrated due to failed smoking cessation attempts. Combining these strategies alongside continued research on the barriers and facilitators of intentions to quit among YSMW are important next steps to combatting the high rates of smoking in this population.

REFERENCES

1. Jamal A , Agaku IT , O'Connor E , King BA , Kenemer JB , Neff L . Current Cigarette Smoking Among Adults — United States, 2005–2013. *MMWR*. 2014; 63(47): 1108–1112.25426653
2. American Lung Association. Smoking out a deadly threat: Tobacco use in the LGBT community. Washington, D.C., 2010.
3. Gruskin EP . Patterns of cigarette smoking and alcohol use among lesbians and bisexual women enrolled in a large health maintenance organization. *Am J Public Health*. 2001; 91(6): 976–979.11392944
4. Gruskin EP , Greenwood GL , Matevia M , Pollack LM , Bye LL . (2007). Disparities in smoking between the lesbian, gay, and bisexual population and the general population in California. *Am J Public Health*. 2007; 97(8): 1496–1502. doi:10.2105/AJPH.2006.09025817600265
5. Rosario M , Corliss HL , Everett BG , Reisner SL , Austin SB , Buchting FO , Birkett M . Sexual orientation disparities in cancer-related risk behaviors of tobacco, alcohol, sexual behaviors, and diet and physical activity: pooled Youth Risk Behavior Surveys. *Am J Public Health*. 2014; 104(2): 245–54. doi:10.2105/AJPH.2013.30150624328632
6. Fallin A , Goodin A , Lee YO , Bennett K . Smoking characteristics among lesbian, gay, and bisexual adults. *Prev Med*. 2015; 74: 123–130. doi:10.1016/j.ypmed.2014.11.02625485860
7. Smith EA . “ If You Know You Exist, It’s Just Marketing Poison”: Meanings of Tobacco Industry Targeting in the Lesbian, Gay, Bisexual, and Transgender Community. *Am J Public Health*. 2008; 98(6): 996–1003.18445800
8. Stevens P , Carlson LM , Hinman JM . An analysis of tobacco industry marketing to lesbian, gay, bisexual, and transgender (LGBT) populations: strategies for mainstream tobacco control and prevention. *Health Promot Pract*. 2004; 5(3): 129S–134S.15231106
9. Washington HA . Burning love: big tobacco takes aim at LGBT youths. *Am J Public Health*. 2002; 92(7): 1086–1095.12084686
10. Montañó DE , Kasprzyk D . Theory of Reasoned Action, Theory of Planned Behavior, and the Integrated Behavioral Model In Glanz K , Rimer BK , Viswanath K (eds.), *Health Behavior and Health Education: Theory, Research and Practice*. 4th Edition San Francisco, CA: Jossey-Bass; 2008: 67–96..
11. Armitage CJ , Conner M . Efficacy of the Theory of Planned Behavior: A meta-analytic review. *Br J Soc Psychol*. 2001; 40: 471–499.11795063
12. Sheeran P , Maki A , Montanaro E , Avishai-Yitshak A , Bryan A , Klein W , Miles E , Rothman A . The impact of changing attitudes, norms, and self-efficacy on health-related intentions and behaviors: A meta-analysis. *Health Psychol*. 2016; 35(11): 1178–1188. doi: 10.1037/hea000038727280365
13. Burkhalter JE , Warren B , Shuk E , Primavera L , Ostroff JS . Intention to quit smoking among lesbian, gay, bisexual, and transgender smokers. *Nicotine Tob Res*. 2009; 11(11): 1312–1320.19778994

14. Pizacani BA , Rohde K , Bushore C , Stark MJ , Maher JE , Dilley JA , Boysun MJ . Smoking-related knowledge, attitudes and behaviors in the lesbian, gay and bisexual community: A population-based study from the US Pacific Northwest. *Prev Med*. 2009; 48(6): 555–561.19306893
15. Blosnich J , Lee JGL , Horn K . A systematic review of the aetiology of tobacco disparities for sexual minorities. *Tob Control*. 2013; 22: 66–73. doi:10.1136/tobaccocontrol-2011-05018122170335
16. Lewis RJ , Kholodkov T , Derlega VJ . Still Stressful After All These Years: A Review of Lesbians' and Bisexual Women's Minority Stress. *Journal of Lesbian Stud*. 2012; 16(1): 30–44. doi:10.1080/10894160.2011.557641
17. Taylor G , McNeill A , Girling A , Farley A , Lindson-Hawley N , Aveyard P . Change in mental health after smoking cessation: systematic review and meta-analysis. *BMJ*. 2014; 348: g1151. doi: 10.1136/bmj.g115124524926
18. Twyman L , Bonevski B , Paul C , Bryant J . Perceived barriers to smoking cessation in selected vulnerable groups: a systematic review of the qualitative and quantitative literature. *BMJ Open*. 2014; 4(12), e006414–e006414. doi:10.1136/bmjopen-2014-006414
19. Meyer IH . Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychol Sex Orientat Gend Divers*. 2013; 1(S): 3–26. doi:10.1037/2329-0382.1.S.3
20. Blosnich JR , Horn K . Associations of discrimination and violence with smoking among emerging adults: differences by gender and sexual orientation. *Nicotine Tob Res*. 2011; 13(12): 1284–95. doi:10.1093/ntr/ntr18321994344
21. Gruskin EP , Byrne KM , Altschuler A , Dibble SL . Smoking it all away: Influences of stress, negative emotions, and stigma on lesbian tobacco use. *J LGBT Health Res*. 2008; 4(4): 167–179.19928044
22. Youatt EJ , Johns MM , Pingel ES , Soler JH , Bauermeister JA . Exploring Young Adult Sexual Minority Women's Perspectives on LGBTQ Smoking. *J LGBT Youth*. 2015; 12(3): 323–342. doi: 10.1080/19361653.2015.1022242.26508993
23. Page MJL , Lindahl KM , Malik NM . The Role of Religion and Stress in Sexual Identity and Mental Health Among Lesbian, Gay, and Bisexual Youth. *J Res Adolesc*. 2013; 23(4): 665–677. doi:10.1111/jora.12025
24. Saewyc EM . Research on Adolescent Sexual Orientation: Development, Health Disparities, Stigma, and Resilience. *J Res Adolesc*. 2011; 21(1): 256–272. doi:10.1111/j.1532-7795.2010.00727.x27099454
25. Johns MM , Pingel ES , Youatt EJ , Soler JH , McClelland SI , Bauermeister JA . LGBT Community, Social Network Characteristics, and Smoking Behaviors in Young Sexual Minority Women. *Am J Community Psychol*. 2013; 52(1–2): 141–154. doi:10.1007/s10464-013-9584-423783884
26. Etter JF , Humair JP , Bergman MM , Perneger TV . Development and validation of the Attitudes Towards Smoking Scale (ATS-18). *Addict*. 2000; 95(4): 613–625. doi:10.1046/j.1360-0443.2000.95461312.x
27. Williams GC , Lynch MF , McGregor HA , Ryan RM , Sharp D , Deci EL . Validation of the “Important Other” Climate Questionnaire: Assessing Autonomy Support for Health-Related Change. *Fam Syst Health*. 2006; 24(2): 179–194. doi:10.1037/1091-7527.24.2.179
28. Cohen S , Kamarck T , Mermelstein R . A global measure of perceived stress. *J Health Soc Behav*. 1983; 24: 385–396. doi:10.2307/21364046668417
29. Shidlo A Internalized homophobia: Conceptual and empirical issues in measurement In Greene B & Herek GM (Eds.), *Lesbian and gay psychology: Theory, research, and clinical application*. Thousand Oaks, CA: Sage, 1994: 176–205.
30. Webb TL , Sheeran P . Does Changing Behavioral Intentions Engender Behavior Change? A Meta-Analysis of the Experimental Evidence. *Psychol Bull*. 2006; 132(2): 249–268. doi: 10.1037/0033-2909.132.2.24916536643

31. Michie S , Hyder N , Walia A , West R . Development of a taxonomy of behaviour change techniques used in individual behavioural support for smoking cessation. *Addict Behav.* 2011; 36(4): 315–319. doi: 10.1016/j.addbeh.2010.11.01621215528
32. Prochaska J , Velicer W . The transtheoretical model fo health behavior change. *Am J Health Promot.* 1997; 12(1): 38–48. doi: 10.4278/0890-1171-12.1.3810170434
33. Eliason MJ , Dibble SL , Gordon R , Soliz GB . The Last Drag: An Evaluation of an LGBT-Specific Smoking Intervention. *J Homosex.* 2012; 59(6): 864–878. doi: 10.1080/00918369.2012.69477022853185
34. Matthews AK , Li CC , Kuhns LM , Tasker TB , Cesario JA . Results from a Community-Based Smoking Cessation Treatment Program for LGBT Smokers. *J Environ Public Health.* 2013; 1–9. doi:10.1155/2013/984508
35. Fredriksen-Goldsen KI , Kim HJ , Barkan SE , Muraco A , Hoy-Ellis CP . Health Disparities Among Lesbian, Gay, and Bisexual Older Adults: Results From a Population-Based Study. *Am J Public Health.* 2013; 103(10): 1802–09. doi:10.2105/AJPH.2012.30111023763391
36. Rosario M , Schrimshaw EW , Hunter J . Cigarette smoking as a coping strategy: negative implications for subsequent psychological distress among lesbian, gay, and bisexual youths. *J Pediatr Psychol.* 2011; 36(7): 731–42. doi:10.1093/jpepsy/jsp14120123704
37. Gorber SC , Schofield-Hurwitz S , Hardt J , Levasseur G , Tremblay M . The accuracy of self-reported smoking: A systematic review of the relationship between self-reported and cotinine-assessed smoking status. *Nicotine Tob Res.* 2009; 11(1): 12–24. doi:10.1093/ntr/ntn01019246437

Table 1.

Descriptive statistics of participants included in analysis (N=338)

	Mean	(SD)	N	(%)
Age	21.60	(1.66)		
Highest Educational Attainment				
Less than high school			7	(2.1%)
Graduated high school			35	(10.4%)
Technical school			29	(8.6%)
Associate degree			23	(6.8%)
Some college			128	(37.9%)
College			94	(27.8%)
Some graduate school			19	(5.6%)
Graduate school			3	(0.9%)
Urbanity				
Urban			193	(57.1%)
Suburban			73	(21.6%)
Rural			66	(19.5%)
Other			6	(1.8%)
Sexual Identity (Primary Identity)				
Lesbian			205	(60.7%)
Bisexual			109	(32.2%)
Other			24	(7.1%)
Racial/Ethnic Identity				
White			227	(67.2%)
African American/Black			47	(13.9%)
Hispanic/Latina			25	(7.4%)
Asian/Pacific Islander			6	(1.8%)
Native American			16	(4.7%)
Mixed Race			17	(5.0%)
Smoking Status				
Some Days			224	(66.3%)
Daily			114	(33.7%)
Smoking Cessation Attempt in Past Year				
No			181	(53.6%)
Yes			157	(46.4%)
Smoking Cessation Intentions	2.78	(1.06)		
Internalized Homophobia	2.13	(.61)		
Perceived Stress	3.08	(.71)		
Attitudes toward Smoking	2.99	(.53)		
Subjective Norms toward Smoking	4.02	(.77)		

Table 2.

Multivariable Logistic Regression of Prior Quit Attempts in Prior Year among Young Sexual Minority Women (N=338)

	OR	95% CI	Wald X^2	<i>p</i> value
Age	.86	(.74, 1.01)	3.80	.06
Urbanity ¹				
Rural/Other	.89	(.46, 1.73)	.12	.74
Suburban	1.55	(.81, 2.95)	1.77	.18
Sexual Identity ²				
Bisexual	1.92	(1.11, 3.31)	5.46	.02
Other	1.49	(.50, 4.48)	.50	.48
Racial/Ethnic Minority ³	.64	(.38, 1.09)	2.69	.10
Daily smoker ⁴	1.50	(.87, 2.59)	2.13	.15
Internalized Homophobia	.44	(.27, .69)	12.24	.001
Perceived Stress	.85	(.58, 1.24)	.71	.40
Attitudes toward Smoking	2.17	(1.27, 3.70)	8.08	.004
Subjective Norms toward Smoking	1.01	(.72, 1.42)	.003	.96

Notes. OR=Odds Ratio; CI=Confidence Intervals.

¹Urban participants serve as referent group.

²Lesbian-identified participants serve as referent group.

³White-identified participants serve as referent group.

⁴Participants *who identified* smoking only on “some days” serve as referent group.

Table 3.

Multivariable regression of intention to quit smoking in the next month among young sexual minority women (N=338)

	b	SE	β	t	p value
(Constant)	3.32	0.95		3.51	.001
Age	.19	.04	.03	.54	.59
Urbanity ¹					
Rural/Other	−.03	.15	−.01	−.17	.87
Suburban	−.08	.15	.03	−.55	.59
Sexual Identity ²					
Bisexual	−.17	.13	−.08	−1.32	.19
Other	−.40	.24	−.10	−1.66	.10
Racial/Ethnic Minority ³	.17	.12	.08	1.40	.16
Daily smoker ⁴	−.30	.13	−.14	−2.40	.02
Prior Smoking Cessation Attempt	.25	.12	.12	1.98	.05
Internalized Homophobia	.08	.11	.05	.74	.46
Perceived Stress	−.03	.08	−.02	−.33	.74
Attitudes toward Smoking	−.38	.12	−.19	−3.17	.001
Subjective Norms toward Smoking	.03	.07	.02	.46	.64

Notes. SE=Standard Error.

¹Urban participants serve as referent group.

²Lesbian-identified participants serve as referent group.

³White-identified participants serve as referent group.

⁴Participants who identified smoking only on “some days” serve as referent group.