

Cigarette Smoking Among Youth at the Intersection of Sexual Orientation and Gender Identity

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Abstract

Purpose: The purpose of this study was to identify subgroups of sexual and gender minority (SGM) youth who are most vulnerable to tobacco use.

Methods: We analyzed data from a national nonprobability sample of 11,192 SGM youth (ages 13–17). Age of cigarette initiation and current use were modeled using Cox proportional hazard and binomial regression. Sexual and gender identities were explanatory variables and the models were adjusted for ethnorracial identity and age.

Results: Approximately 7% of the sample reported current smoking. Cisgender and transgender boys had higher odds of current smoking compared with cisgender and transgender girls (adjusted odds ratio [AOR] = 1.86; 95% confidence interval [CI]: 1.56–2.21). Pansexual-identified youth had higher odds of smoking (AOR = 1.33; 95% CI: 1.05–1.70) compared with gay/lesbian youth independent of gender identity. Pansexual-identified cisgender boys had the highest smoking prevalence (21.6%). Predicted probabilities were higher among transgender boys across all sexual identities, except asexual. The hazard of smoking at a younger age was greater for transgender boys compared with cisgender boys (adjusted hazard ratio [AHR] = 1.67; 95% CI: 1.43–1.94) as well as for bisexual (AHR = 1.12; 95% CI: 1.01–1.24) and pansexual (AHR = 1.17; 95% CI: 1.03–1.33) youth compared with those who identified as gay or lesbian.

Conclusions: These findings suggest that transgender boys may be at higher risk for early and current cigarette use regardless of their sexual identity, whereas smoking varied more widely for youth across different sexual identities. The findings suggest that specific subgroups of SGM youth require focused attention in tobacco control research and practice.

Keywords: adolescence, intersectionality, nonbinary, tobacco use

Introduction

A SUBSTANTIAL BODY OF research demonstrates that sexual minority populations (inclusive of gay, lesbian, and bisexual persons) use tobacco products at a higher rate than their heterosexual peers.¹ This is an important health issue as sexual minority youth report earlier smoking initiation and continue to smoke at higher rates throughout adulthood^{1–4}; however, there is large variability in smoking prevalence across sexual minority subgroups.^{5–7} Evidence among adults suggests that bisexual females smoke at higher rates than either heterosexual- or lesbian-identified females.^{5,7} The patterns of tobacco use among sexual minority men have been less consistent across studies and vary across age cohorts.^{6,7}

Although few studies have examined tobacco use among gender minority youth (i.e., individuals assigned a sex at

birth and who identify as transgender, another gender identity, or do not endorse a binary gender identity),^{8,9} some evidence among adults suggests high rates of smoking among these populations.¹⁰ Younger cohorts of gender minority individuals may be particularly vulnerable.^{8,9}

The descriptive literature regarding tobacco use among sexual and gender minority (SGM) youth is limited in a few important ways. First, the intersection of sexual and gender identities has not been explored sufficiently. Gender identity, inclusive of transgender identities, is not measured in most studies that demonstrate a link between sexual identity and tobacco use. Experiences of minority stress among SGM populations—commonly referenced as an explanatory factor related to substance use disorders more generally and tobacco use more specifically^{11,12} in the form of gender- and sexuality-based harassment—have been

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found to have a synergistic relationship with smoking among youth.¹³

Second, in studies in which gender identity is measured, transgender is often operationalized as a binary variable.^{9,13} This oversimplified measurement of gender identity likely masks important differences within transgender communities (e.g., differences among trans masculine, trans feminine, and nonbinary identities). Existing evidence suggests that conformity to masculine gender norms is associated with substance use, including tobacco use.^{14,15}

Third, tobacco use as a gendered and sexualized behavior may be particularly appealing to adolescents who are actively engaged in identity development. Smoking was associated with masculinity, toughness, and attractiveness among SGM youth in qualitative research.^{16,17} This imagery is consistent with marketing strategies used by tobacco companies to promote tobacco as a symbol of masculinity, control, and virility.^{18,19} If smoking is a culturally relevant means of identity expression, then we may observe differential uptake among SGM populations for whom these cultural symbols (e.g., masculinity, virility, and independence) are particularly salient. Transgender boys may be particularly vulnerable to tobacco initiation as a means of expressing a masculine gender identity. Furthermore, youth who endorse emerging sexual identity labels (e.g., pansexual²⁰) may be more prone to symbols emphasizing independence and opposition to dominant social norms (e.g., smoking as a stigmatized behavior). However, youth who identify as asexual (i.e., lack of sexual attraction), for whom these sexualized messages may be less appealing, may be less likely to smoke as has been reported in adults.⁶

Disaggregating smoking behaviors across diverse sexual and gender identities can provide insight into important variations in initiation and patterns of use within SGM youth populations. Identifying the most vulnerable SGM youth subgroups can inform more precise targeting of population-based tobacco control interventions as well as advance our understanding of the sociocultural aspects of tobacco use for this population.

In this exploratory study, we sought to (1) disaggregate cigarette smoking across a range of SGM identities and (2) identify SGM youth most vulnerable to cigarette smoking through analysis of (a) age of initiation and (b) current smoking. Specifically, we sought to examine whether smoking initiation and use differ between and within sexual and gender identity subgroups. In addition to addressing these exploratory aims, we sought to test the following hypotheses: (hypothesis 1) masculine-focused gender identities (i.e., cisgender and transgender boys) will be positively associated with current smoking; (hypothesis 2) asexual identity will be negatively associated with current smoking; and (hypothesis 3) emerging sexual identities (i.e., pansexual and other) will be positively associated with current smoking.

Methods

This was a secondary data analysis of a nonprobability national web-based survey of youth. Data were drawn from the LGBTQ National Teen Survey, a comprehensive survey designed to advance understanding of the health and well-being of SGM youth in the United States.^{20,21} Data were collected in partnership with the Human Rights Campaign (HRC) between April and December 2017. The parent study included several inclusion criteria. Participants needed

to be 13–17 years of age; be able to read English; identify as lesbian, gay, bisexual, transgender, gender nonconforming, queer, and/or questioning; and live in the United States. Inclusion criteria in this secondary analysis also included complete data on smoking behaviors. All participants resided in the United States at the time of survey completion. Participants were incentivized with a lottery drawing for an Amazon .com gift card and were offered wristbands from the HRC.

Participants were recruited through social media (Twitter, Facebook, Instagram, reddit, and Snapchat) with the assistance of social influencers, who shared the survey weblink through their social media profiles, and the HRC wide-reaching network of community partners. Participants provided assent through the information page of the survey. Participants were informed that their participation was anonymous, voluntary, and could be terminated at any time. The University of Connecticut Institutional Review Board granted permission for parental consent to be waived, indicating that parental consent would potentially place youth at more risk than waiving the consent.

Measures

Measures were adapted from an existing national survey (the Youth Risk Behavior Survey [YRBS]).²² Gender identity was assessed by a two-part question. First, participants were asked about their current gender identity (What is your current gender identity?). The following response options were provided: male, female, trans male/trans boy, trans female/trans girl, nonbinary, gender queer/gender nonconforming, or different identity (please state). Next, participants were asked to report their sex at birth (What sex were you assigned at birth?) with the following two response options: male or female (intersex was not included as an option). This two-step measure of gender identity is commonly used in research.²³ Youth with concordant sex at birth and current gender identities were coded as cisgender boys or girls. Participants who identified with a binary male gender identity (i.e., male or trans male/boy) and were assigned female at birth were coded as transgender boys. Likewise, those who identified with a binary female gender identity (i.e., female or trans female/girl) and were assigned male at birth were coded as transgender girls. Youth identifying as nonbinary, gender queer/nonconforming, or with some other non-trans non-cisgender identity (i.e., different identity) were coded as having a nonbinary gender identity.

One measure of sexual orientation (i.e., sexual identity) was assessed with the following item: “How do you describe your sexual identity?” Participants could choose one of the following options: gay or lesbian; bisexual; straight, that is, not gay (herein referred to as heterosexual); or something else. If a participant chose “something else”, survey logic presented another question that stated “By something else, do you mean...” and were presented with the following response options: queer, pansexual, asexual, questioning, and other. No additional definitions of these responses were provided. Because of low cell sizes, those who indicated other, queer, or questioning were recoded as “other” for this analysis.

Current smoking was operationalized as any cigarette use in the previous 30 days. Participants were asked, “During the past 30 days, on how many days did you smoke cigarettes?” The following categorical response options were provided: 0 days, 1 or 2 days, 3 to 5 days, 6 to 9 days, 10 to 19 days,

20 to 29 days, and all 30 days. This variable was dichotomized into smoked at least 1 cigarette in the past 30 days compared with those who did not smoke any cigarettes. The following item was asked for those participants who had ever tried smoking a cigarette at least once in their life: "How old were you when you first tried cigarette smoking, even one or two puffs?" Responses were recorded as categorical (8 or younger, 9–10, 11–12, 13–14, 15–16, and 17 or older). These measures reflect the items used in the YRBS.²²

Age and ethn racial identity, two variables considered to be predictive of cigarette use and initiation, were included as covariates.²⁴ Ethn racial identity was assessed by asking "How would you describe yourself? (Select all that apply)." Response options included White, non-Hispanic, non-Latino; Black or African American; American Indian or Alaska Native; Asian or Pacific Islander; Latino, Hispanic, or Mexican American; and other. If a participant selected multiple responses, they were recoded as multiracial.

Analyses

In total, 29,291 youth aged 13–17 across the United States entered the survey website (i.e., consent page in the survey); among these respondents, 8985 (30.67%) were not eligible to complete the survey because they were outside of the eligible age range (13–17 years old), did not reside in the United States at the time of survey attempt, and/or did not identify as a sexual and/or gender minority, resulting in 20,306 participants who were eligible and started the survey. Among those eligible, 3006 (14.8%) participants completed less than 10% of the survey (i.e., did not answer all demographic items) and were thus excluded from data analysis. In total, 11,192 had complete data on tobacco use and served as the analytic sample in this study.

Descriptive analyses were used to examine current smoking by gender and sexual identity using chi-square independence or Fisher's exact tests where appropriate. The demographic characteristics, including age and ethn racial identity, were disproportionately distributed across gender and sexual identity subgroups. Because these variables are also associated with tobacco use, they were included as covariates in multivariable models. Multivariable binomial logistic regression analysis was used to examine the associations between sexual and gender identities and current smoking, adjusting for ethn racial identity and age. Based on this model (model 1), predicted probabilities (and 95% confidence intervals [CIs]) were calculated, holding age at the mean and ethn racial identity at the reference (i.e., non-Hispanic White). To examine the role of masculine-focused gender identities in tobacco use, a categorical variable was created to compare cisgender and transgender boys and nonbinary youth with cisgender and transgender girls. Cumulative incidence plots and Cox proportional hazards regression were used to describe and examine associations between different sexual and gender identities and age at first cigarette use, adjusting for ethn racial identity and age.

Results

Characteristics of the study sample

Sample characteristics are reported in Table 1. The sample ranged in age from 13 to 17 years (22.4% were 13–14, 47.0% were 15–16, and 30.6% were 17). A majority reported their

TABLE 1. SAMPLE CHARACTERISTICS

Demographics	n (%)
Age, years	
13–14	2504 (22.4)
15–16	5263 (47.0)
17	3425 (30.6)
Sex assigned at birth	
Male	2752 (24.6)
Female	8440 (75.4)
Gender identity	
Cisgender boy	2358 (21.1)
Cisgender girl	4944 (44.2)
Transgender boy	969 (8.7)
Transgender girl	127 (1.1)
Nonbinary youth	2794 (25.0)
Ethn racial identity ^a	
White	7315 (65.4)
Black/African American	505 (4.5)
American Indian/Alaska Native	51 (0.5)
Asian/Pacific Islander	433 (3.9)
Latinx/Hispanic	1158 (10.4)
Multiracial	1527 (13.7)
Other	191 (1.7)
Sexual identity	
Gay/Lesbian	4117 (36.8)
Bisexual	3774 (33.7)
Heterosexual	181 (1.6)
Pansexual	1562 (14.0)
Other	1013 (9.1)
Asexual	545 (4.9)

^aData were missing for 12 respondents.

ethn racial identity as non-Hispanic White (65.4%) and female sex assigned at birth (75.4%). Most identified as cisgender (65.2%), followed by nonbinary (25.0%), or transgender (9.8%). Approximately three quarters of the sample identified as gay/lesbian, bisexual, or heterosexual (36.8%, 33.7%, and 1.6%, respectively), with the remainder identifying as pansexual, asexual, or other (14.0%, 4.9%, and 9.1%, respectively).

Prevalence of current cigarette smoking

Approximately 7.0% of the sample reported current smoking. As shown in Table 2, transgender boys had the highest smoking prevalence (14.3%; 95% CI: 12.2–16.7), followed by cisgender boys (7.7%; 95% CI: 6.6–8.8), transgender girls (7.1%; 95% CI: 3.3–12.0), nonbinary youth (6.5%; 95% CI: 5.6–7.5), and cisgender girls (5.3%; 95% CI: 4.7–5.9). CIs overlapped in all groups except for transgender boys. Pansexual-identified cisgender boys had the highest smoking prevalence (21.6%), whereas asexual cisgender girls had the lowest smoking prevalence (1.0%). Among cisgender boys and girls, there were statistically significant bivariate differences in current smoking by sexual identity ($p < 0.01$). Similar differences were not identified among transgender boys or girls or nonbinary youth.

Hypothesis 1: Masculine-focused gender identities will be positively associated with current smoking

Associations of current smoking with gender and sexual identities are reported in Table 3. As hypothesized, masculine-focused gender identities (i.e., cisgender and transgender

TABLE 2. CURRENT SMOKING BY SEXUAL AND GENDER IDENTITIES (N=11,192)

	Gender identity											
	Total current smokers		Cisgender boy		Cisgender girl		Transgender boy		Transgender girl		Nonbinary youth	
	n	%	n	%	n	%	n	%	n	%	n	%
Total	772	6.9	181	7.7	261	5.3	139	14.3	9	7.1	182	6.5
By sexual identity												
Gay/Lesbian	268	6.5	124	7.4	79	5.1	26	15.5	1	4.2	38	5.6
Bisexual	265	7.0	40	7.2	141	6.2	37	13.9	4	10.0	43	7.0
Heterosexual	23	12.7	—	—	—	—	17	16.2	2	10.5	4	7.0
Pansexual	133	8.5	11	21.6	26	4.9	40	16.5	2	7.7	54	7.6
Other	62	6.1	3	7.3	13	3.7	15	11.3	0	0	31	6.6
Asexual	21	3.9	3	15.0	2	1.0	4	7.4	0	0	12	4.7
Chi-square (df) ^a			15.9 (4)		13.5 (4)		4.5 (5)		2.6 (5)		4.0 (5)	
p-value			<0.01 ^b		<0.01		0.48		0.87 ^b		0.55	

^aChi-square test of difference by sexual identity within the gender identity subgroup (columns).

^bFisher's exact test.

boys) were positively associated with current smoking (Table 3). As a group, cisgender and transgender boys had higher odds of current smoking compared with cisgender and transgender girls (adjusted odds ratio [AOR] = 1.86; 95% CI: 1.56–2.21). Smoking prevalence was similar for nonbinary youth and cisgender and transgender girls. Cisgender girls had significantly lower odds (AOR = 0.70; 95% CI: 0.56–0.86) and transgender boys had higher odds (AOR = 2.00; 95% CI: 1.53–2.60) of smoking compared with cisgender boys.

The independent association of trans masculine identity and smoking is evident when examining predicted probabilities of current smoking (Fig. 1). Transgender boys had higher predicted probabilities of smoking (>0.10) across all sexual identity subgroups except those identifying as asexual, whereas predicted probabilities were lower (<0.10) among the other SGM subgroups, including cisgender boys.

Hypothesis 2: Asexual identity will be negatively associated with current smoking

Asexual youth had lower odds of current smoking compared with gay/lesbian youth (Table 3; AOR = 0.56; 95% CI: 0.35–0.89).

Hypothesis 3: Emerging sexual identities (i.e., pansexual and other) will be positively associated with current smoking

Pansexual-identified youth (Table 3; AOR = 1.33; 95% CI: 1.05–1.70), but not those who identified as “other” sexual identity, had higher odds of current smoking compared with gay/lesbian youth. These associations were independent of gender identity.

Intersection of gender and sexual identity

There was a significant interaction between male gender and pansexual sexual identity ($b = 0.63$, $p < 0.01$). Pansexual-identified cisgender boys had more than three times the odds of smoking than gay-identified cisgender boys (AOR = 3.11; 95% CI: 1.54–6.27); conversely, pansexual-identified transgender boys did not have higher odds of smoking when compared with gay-identified transgender boys (AOR = 1.07; 95% CI: 0.62–1.86).

Age at smoking initiation

Approximately 50% of transgender boys in this sample had initiated smoking by the age of 17 compared with 25% of cisgender boys (Fig. 2). In hazard models adjusted for age and ethn racial identity, the hazard of smoking initiation at a younger age was higher for transgender boys compared with cisgender boys (adjusted hazard ratio [AHR] = 1.67; 95% CI: 1.43–1.94), as well as for participants who identified as bisexual (AHR = 1.12; 95% CI: 1.01–1.24) or pansexual (AHR = 1.17; 95% CI: 1.03–1.33) compared with those who identified as gay/lesbian. Hazards were lower for cisgender girls compared with cisgender boys (AHR = 0.84; 95% CI: 0.75–0.94) and for asexual-identified youth (AHR = 0.50; 95% CI: 0.39–0.66) compared with those who identified as gay/lesbian.

Discussion

Using a national nonprobability sample of SGM youth, we examined the intersections of sexual and gender identities in

TABLE 3. ASSOCIATION OF CURRENT SMOKING WITH GENDER AND SEXUAL IDENTITIES

	Current smoking	
	AOR (95% CI)	p-value for Wald chi-square
Model 1: Independent associations of gender and sexual identities ^a (N=11,180)		
Gender identity		
Cisgender boy	1.00	
Cisgender girl	0.70 (0.56–0.86)	<0.01
Transgender boy	2.00 (1.53–2.60)	<0.01
Transgender girl	0.87 (0.43–1.77)	0.70
Nonbinary youth	0.88 (0.69–1.11)	0.29
Sexual identity		
Gay/Lesbian	1.00	
Bisexual	1.19 (0.99–1.44)	0.06
Heterosexual	1.26 (0.77–2.06)	0.36
Pansexual	1.33 (1.05–1.70)	0.02
Other	0.90 (0.66–1.21)	0.48
Asexual	0.56 (0.35–0.89)	0.01
Model 2: Boys and nonbinary youth vs. girls ^b (N=11,180)		
Cisgender/transgender girls	1.00	
Cisgender/transgender boys	1.86 (1.56–2.21)	<0.01
Nonbinary youth	1.20 (0.98–1.47)	0.08

^aIn model 1, gender and sexual identities were entered simultaneously after adjusting for age and ethn racial identity.
^bIn model 2, gender identity was entered after adjusting for sexual identity, age, and ethn racial identity.
 AOR, adjusted odds ratio; CI, confidence interval.

smoking behaviors. The overall smoking rate in the current sample (7.0%) was lower than the national average (8.8%) among adolescents in the same age group²⁵; however, we did identify much higher rates—and in some cases much lower rates—among SGM youth subgroups. We found that transgender identity was associated with higher smoking prevalence among youth. Higher smoking rates among transgender youth have been reported previously.^{9,13} This study adds nuance to these previous reports. Although transgender identity was associated with increased risk of tobacco use, our results suggest considerable variation by sexual and gender identities in smoking behaviors.

Notably, transgender boys were at elevated risk for current smoking and early initiation compared with the other sub-

groups in this sample, independent of their sexual identity. This elevated risk for cigarette use may reflect unique experiences related to their gender identity or gender expression. In previous qualitative research, smoking was associated with expressions of toughness and masculinity¹⁶; thus, transgender boys may utilize smoking as a behavioral expression of a masculine gender identity.

Unlike previous studies of sexual minority youth,²⁶ bisexual youth in our sample did not report significantly greater odds of current smoking compared with lesbian or gay-identified youth; however, the odds ratio approached statistical significance ($p=0.06$) after controlling for gender identity. Our study extends these findings by examining smoking behaviors among other sexual minority identities,

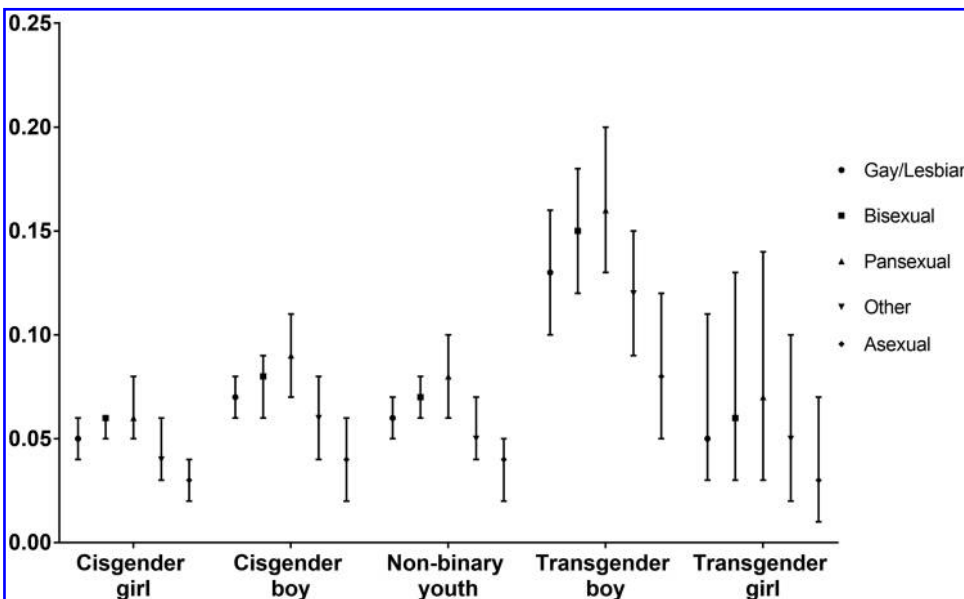


FIG. 1. Predicted probability of current smoking by gender identity across sexual identities: The LGBTQ National Teen Survey. The error bars represent 95% CIs around predicted probabilities. CI, confidence interval.

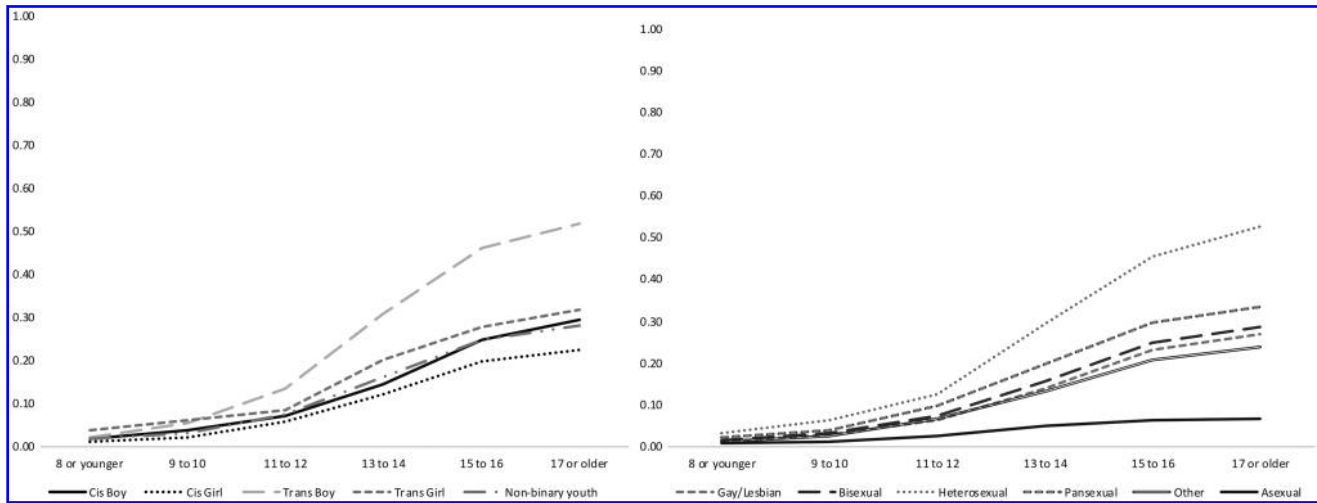


FIG. 2. Cumulative incidence plots of age at first cigarette smoking by gender identity and sexual identity: The LGBTQ National Teen Survey. Cis, cisgender; Trans, transgender.

such as pansexual and asexual. Pansexual-identified youth, for example, were at greater risk for early initiation and current smoking than gay or lesbian youth. In this way, youth who identified as pansexual exhibited greater tobacco use behaviors than gay or lesbian youth. Conversely, asexual youth were half as likely to indicate earlier initiation and current use relative to gay or lesbian youth and evidenced the lowest prevalence of current smoking out of all sexual identity subgroups. Studies of adults have also found lower tobacco use among those who identify as asexual.⁶

Of particular interest in the current investigation was how sexual orientation and gender identity interact to contribute to risk for cigarette use. Although we did not measure gender expression directly, we did find similar patterns of cigarette use among participants who identified with a male gender identity (i.e., cisgender or transgender boys) regardless of sex assigned at birth. When these boys were compared with females (i.e., cisgender or transgender girls) and nonbinary youth, they exhibited higher odds of smoking. Furthermore, pansexual cisgender and transgender boys reported the highest prevalence of smoking. Higher smoking prevalence and early adoption among cisgender and transgender boys compared with cisgender and transgender girls suggest that gender expression may underlie these differences; however, the etiology of these patterns likely results from multilevel influences on tobacco use behaviors that are intricately tied to social identities along with the social norms, behavioral exposures, and social networks associated with those identities.²⁷ Conformity to masculine gender norms has previously been identified as a risk factor for substance use.¹⁴ Further qualitative research is needed to identify the social factors that link the development of sexual and gender identities—particularly trans masculine, bisexual, and pansexual identities—to tobacco use. Overall, these findings suggest that there are important differences between subgroups of SGM youth that can inform further research and practice.

Limitations

These findings should be interpreted with the following limitations. We use a nonprobability sample of youth col-

lected online. Although the sample was diverse with regard to ethn racial identity, minority groups were still underrepresented. In addition, nearly 15% of eligible respondents did not complete the survey and were excluded from the analysis. The findings are therefore not generalizable to SGM youth in the United States. Given that youth were recruited through SGM-specific social media and community centers, these youth may also be more connected with supportive networks and resources. They may also be more embedded in SGM communities where sexual and gender identities are more salient. It is also possible that the meanings of the identity labels explored (e.g., pansexual) vary among respondents, adding variability within groups and overlapping variability between groups. Similarly, specific subgroups of SGM youth in our sample were small, particularly for transgender girls, which may result in low reliability for some estimates. Tobacco use was measured retrospectively and without biochemical verification, thus subject to recall bias. Although we are able to hypothesize that risk for early initiation and current cigarette use among transgender boys may be the result of specific experiences related to their gender identity and expression (e.g., smoking as a masculine behavior), we were not able to test this hypothesis directly. Future mixed methods research should examine how and why masculine gender identities and trans masculine youth, in particular, may be at greater risk for early and current cigarette use.

Conclusions

The findings reported in this article offer new perspectives on tobacco use among subgroups of SGM youth, offering new hypotheses to investigate to advance our understanding of the health disparities experienced by these vulnerable populations. Importantly, the results suggest that SGM youth are heterogeneous with regard to tobacco initiation and use. Targeted prevention and cessation efforts should consider both sexual orientation and gender identity and pay particular attention to emerging sexual identities such as pansexual. A quarter of this sample did not identify with a binary gender identity or a sexual identity (e.g., gay, lesbian, or bisexual) that is typically measured in tobacco research. Expanding

measurement of gender and sexual identities in research focused on youth should be considered.

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Author Disclosure Statement

No competing financial interests exist.

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