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Prevalence and correlates of smoking and e-cigarette use among young men who have sex with men and transgender women

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Abstract

Background—Although the prevalence of cigarette smoking in the United States has decreased, rates remain elevated among sexual and gender minorities (SGMs). This study examined rates and correlates of tobacco use among young men who have sex with men (YMSM) and transgender women.

Methods—Participants (N=771) were drawn from the baseline assessment of an ongoing longitudinal cohort study of racially diverse MSM aged 16–29 years. Data collection took place in 2015–2016. Socio-demographic and SGM-specific (e.g., gender identity, sexual identity, physical attraction) correlates of cigarette smoking and electronic cigarette (e-cigarette) use were identified using logistic regression.

Results—Twenty-one percent were current cigarette smokers. Nearly 40% ever tried an e-cigarette, but regular e-cigarette use was low (3.8%). Smokers were more likely to be older (vs. aged 16–18), less educated, homeless, bisexual or identify as some other sexual minority (vs. gay), attracted to males and females equally or more attracted to females than males (vs. males only), and HIV-positive. E-cigarette users were more likely to be transgender women (vs. cisgender men), White (vs. Black), more educated, and mostly attracted to females.

Conclusions—Findings highlight important risk factors for tobacco use among SGM youth. Correlates of smoking mirrored findings observed in the general population, but also included

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Contributors

MG led the conception and writing of the manuscript and conducted the statistical analyses. MB and BM assisted with the conception of the manuscript, interpretation of the results, and writing of the manuscript. All authors read and approved the final version of the manuscript.

Conflict of Interest

No conflict declared.

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factors specific to SGM youth (e.g., sexual orientation, HIV status, homelessness). Although some variables (gender identity, attraction) demonstrated similar relationships with smoking and e-cigarette use, others (race/ethnicity, education) demonstrated opposite patterns. Findings underscore the urgent need for tobacco prevention and cessation interventions for SGM youth.

Keywords

Young men who have sex with men; Transgender women; Cigarette smoking; Electronic cigarettes

1.0 Introduction

Although the prevalence of cigarette smoking in the United States has decreased, rates remain elevated among sexual and gender minorities (SGMs; e.g., individuals who identify as lesbian, gay, bisexual, or transgender, LGBT) (Jamal et al., 2016; Lee et al., 2009). Numerous studies have documented significantly higher rates of cigarette smoking among sexual minorities than their heterosexual counterparts (Dai, 2017; Emory et al., 2016; Fallin-Bennett et al., 2017; Hu et al., 2016; Johnson et al., 2016). Similar disparities have been observed for transgender individuals (Buchting et al., 2017; Smalley et al., 2016), although less data are available.

The literature on tobacco use among SGM populations is characterized by several gaps. Most studies have compared LGB individuals to their heterosexual counterparts and, in doing so, the large majority combine all sexual minority individuals into a single category (Blosnich et al., 2011; Jamal et al., 2016). Although such work has brought attention to tobacco-related disparities among SGMs, it fails to acknowledge the wide range of individuals that fall under the larger SGM umbrella and obscures differences within SGM subgroups. In addition, few studies have examined relationships between tobacco use and different aspects of sexual orientation such as sexual identity (e.g., whether someone identifies as gay or bisexual) and physical attraction (e.g., the sex of individuals to whom someone is physically attracted). Most studies typically assess only one aspect, usually sexual identity. Different components of sexual orientation may display different relationships with tobacco use.

Further, little is known about use of emerging tobacco products such as electronic cigarettes (e-cigarettes) among SGMs. E-cigarettes remain controversial in the public health community because although they appear to pose less health risk than combustible cigarettes and may help current smokers quit (Glasser et al., 2017; Malas et al., 2016), their use may simply prolong smoking (i.e., lead to dual use) and encourage youth to start smoking (Leventhal et al., 2015; Primack et al., 2015). Studies in the United States have documented increases in e-cigarette use since 2011 (Singh et al., 2016), especially among sexual minority adolescents and young adults (Dai, 2017; Fallin-Bennett et al., 2017).

The present study examined correlates of cigarette smoking and e-cigarette use among late adolescent and young adult (16–29 year-old) men who have sex with men (MSM) and transgender women – a population displaying elevated rates of tobacco use (Fallin-Bennett et al., 2017; Johnson et al., 2016). The goal of this study was not to compare gay, bisexual, and transgender individuals to their heterosexual/cisgender peers, but rather to identify

correlates of tobacco use *within* a large cohort of racially diverse MSM reporting different sexual (e.g., gay, bisexual) and gender identities (e.g., cisgender man, transgender woman). Another objective was to identify correlates of tobacco use that may be specific to SGMs, such as gender identity and sexual orientation (as assessed by both sexual identity and physical attraction).

2.0 Methods

2.1 Participants and Procedure

Data were collected as part of RADAR, an ongoing longitudinal cohort study of young MSM (YMSM) and transgender women in the Chicago metropolitan area. Informed consent was obtained for participants ages 18 and informed assent with a decisional capacity assessment and waiver of parental consent was obtained for 16–17 year olds. Participants were recruited using various methodologies. A subset of participants from two existing longitudinal cohort studies, Project Q2 (Mustanski et al., 2016) and Crew 450 (Mustanski et al., 2017) who were first recruited in 2007 and 2010 respectively, were eligible for enrollment. In 2015, a third cohort was recruited using similar approaches to the prior studies. These recruits must have been between 16 and 20 years of age, assigned male sex at birth, spoke English, and had a sexual encounter with a man in the previous year or identified as gay, bisexual, or transgender. Next, the RADAR cohort was expanded through an iterative process by which initial seeds' serious romantic partners were recruited at each visit. All serious romantic partners who were assigned male sex at birth were eligible for enrollment regardless of gender identity or sexual behavior, attraction, or identity. Lastly, cohort members could refer three peers for enrollment, as long as they were aged 16–29 and met other criteria.

Data for the current analyses were drawn from 771 participants who completed the baseline assessment between February 2015 and November 2016. Sixty percent were age 21 or younger and over 75% identified as a racial/ethnic minority (Table 1).

2.2 Measures

We assessed socio-demographic characteristics, HIV status, and tobacco use. Participants not previously diagnosed with HIV received HIV testing. A positive test was confirmed via laboratory testing (Centers for Disease Control and Prevention and Association of Public Health Laboratories, 2014). Lifetime prevalence of cigarette smoking and e-cigarette use were assessed with the following questions drawn from the Monitoring the Future study (Johnston et al., 2015; Johnston et al., 2010): “Have you ever smoked cigarettes?” “Have you ever smoked e-cigarettes?” Response options included: Never, Once or twice, Occasionally but not regularly, Regularly in the past, Regularly now. Participants who responded “regularly now” were classified as current smokers. Because e-cigarettes are a relatively new tobacco product and any regular use is likely to be recent, participants who responded “regularly now” or “regularly in the past” were classified as e-cigarette users. We also assessed past 30 day use among participants who ever used cigarettes or e-cigarettes.

2.3 Statistical Analyses

We computed descriptive statistics for all measures (Table 1). We used univariable logistic regression to identify initial correlates of current combustible cigarette smoking and regular e-cigarette use. All variables associated with the outcome at $p \leq .10$ were subsequently entered into a multivariable logistic regression analysis to identify independent correlates.

3.0 Results

3.1 Rates of Tobacco Use

Of the 516 who ever tried a cigarette, 58% ($n=299$) had smoked within the past 30 days and 21% ($n=159$) were current cigarette smokers. Nearly 40% ($n=294$) had ever tried an e-cigarette. Of those, 24% ($n=72$) used e-cigarettes within the past 30 days and 3.8% reported regular current ($n=11$) or past ($n=18$) e-cigarette use.

3.2 Correlates of Combustible Cigarette Use

All socio-demographic variables and HIV status were associated with current smoking in the univariable analysis (Table 2). Due to the high overlap between sexual identity and physical attraction, we conducted two separate multivariable analyses for smoking: one included identity (but not attraction) and the other included attraction (but not identity). In the multivariable analyses, sexual identity and physical attraction, as well as age, education, living situation, and HIV status emerged as independent correlates (Table 2). Participants from all older age categories were two to four times more likely to be current smokers relative to 16–18 year-olds. Attending some college or more was associated with significantly lower odds of smoking relative to completing less than a high school education. Participants who lived in a shelter or did not have a permanent address were about four times more likely to smoke compared to participants living with their parents. In the analysis that contained sexual identity, participants who identified as bisexual or another sexual identity (e.g., pansexual) were about twice as likely as gay participants to be current smokers. In the analysis that contained attraction, participants who were attracted to males and females equally or were mostly attracted to females but some males were three and eight times more likely to be current smokers, respectively, relative to participants who were attracted to only males. Finally, HIV-positive participants were over three times more likely to be current smokers compared to HIV-negative participants.

3.3 Correlates of E-Cigarette Use

Univariable and multivariable correlates of e-cigarette use were identical and included race/ethnicity, education, gender identity, and physical attraction (Table 2). Black/African American participants were 78% less likely to be e-cigarette users relative to White participants. Participants who completed some graduate school or had a graduate degree were over eight times more likely to be e-cigarette users relative to those with less than a high school education. Transgender women were 4.5 times more likely to be e-cigarette users than cisgender men. Finally, relative to participants who were attracted to only males, those who were attracted to mostly females but some males were over five times more likely to use e-cigarettes.

4.0 Discussion

Rates of cigarette and e-cigarette use were elevated among this sample of adolescent and young adult MSM and transgender women. Among ever users, nearly 60% smoked a cigarette and 24% used e-cigarettes in the past 30 days, rates that are comparable with other studies of SGM youth (Blosnich et al., 2011; Corliss et al., 2013; Dai, 2017; Fallin-Bennett et al., 2017; Newcomb et al., 2014). Findings underscore the urgent need for tobacco prevention and cessation efforts for SGM youth.

We identified several correlates of tobacco use specific to SGM populations. Although gender identity was not an independent correlate of smoking, transgender women were more likely than cisgender men to smoke and use e-cigarettes. Both sexual identity and physical attraction predicted smoking, but only attraction was associated with e-cigarette use. Relative to gay participants, the odds of smoking were about twice as high among participants who identified as bisexual or other. Participants who were mostly attracted to females but some males (vs. only males) were more likely to smoke and use e-cigarettes. Findings underscore the importance of delineating between different components of sexual orientation (sexual identity, attraction, or behavior), especially as different patterns of substance use have been linked to different sexual orientation components in previous research (Russell et al., 2002; McCabe et al., 2005). Consistent with previous studies (Akhtar-Khaleel et al., 2016; Lifson and Lando, 2012), we observed considerably higher rates of smoking among HIV-positive than HIV-negative individuals. As YMSM make up the majority of new HIV infections in the United States (Centers for Disease Control and Prevention, 2014) and the negative consequences of smoking are amplified in individuals living with HIV (Helleberg et al., 2013), effective cessation programs for HIV-positive smokers are crucial. Finally, homelessness—an especially pertinent issue for SGM youth (Coker et al., 2010)—was associated with higher odds of smoking.

Although some variables such as gender identity and attraction demonstrated similar relationships with smoking and e-cigarette use, others such as race/ethnicity and education demonstrated opposite patterns. For instance, relative to White participants, Black/African American participants were more likely to smoke, but were far less likely to use e-cigarettes. Further, although educational attainment displayed a protective effect for smoking, participants who completed some graduate school or held a graduate degree were substantially more likely to be regular e-cigarette users. Greater e-cigarette use among these individuals could reflect the desire to use a less risky tobacco product (Pampel et al., 2010).

Various factors may explain higher rates of tobacco use among SGM populations including targeted LGBT marketing campaigns by the tobacco industry (Stevens et al., 2004; Washington, 2002) and heightened levels of stress (Blosnich et al., 2013; Blosnich and Horn, 2011). The minority stress model (Meyer, 2003) holds that the prejudice, discrimination, and violence experienced by SGMs create a stressful social environment, which may increase risk for poor mental health outcomes, including substance use. Indeed, tobacco use may be one way SGM individuals attempt to cope with such stress.

Findings must be considered in light of several limitations. First, although we recruited a large and diverse sample of Chicago SGM youth, findings may not generalize to MSM and transgender women living in other regions. Second, the sample was limited to youth assigned male sex at birth. Third, sexual behavior (the sex of someone's sexual partner(s)) was not examined. Fourth, given the small sample size for some subcategories, some OR estimates had wide CIs and thus should be interpreted with caution.

5.0 Conclusions

The present study advances the literature by providing a nuanced understanding of risk factors for tobacco use within a large, diverse cohort of YMSM and transgender women. Although additional research is needed to understand the reasons underlying elevated rates of tobacco use among SGM youth, the current study provides a useful platform for these efforts and may be valuable in guiding tobacco prevention and cessation interventions with SGM populations.

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Highlights

- We examined correlates of cigarette smoking and e-cigarette use among sexual and gender minority (SGM) youth.
- Some correlates of smoking mirrored findings in the general adult population.
- Correlates specific to SGM youth (gender identity, attraction) were also found.
- Predictors of smoking and e-cigarette use were only partially overlapping.
- Findings highlight important risk factors for tobacco use among SGM youth.

Table 1

Descriptive Statistics for Socio-demographic Characteristics, HIV Status, and Lifetime Prevalence of Cigarette Smoking and E-Cigarette Use (N=771)

Variable	N (%)
Age category	
16–18 years	202 (26)
19–21 years	263 (34)
22–24 years	208 (27)
25–29 years	98 (13)
Race/Ethnicity	
White	178 (23)
Black or African American	278 (36)
Hispanic/Latino	226 (29)
Multiracial or Other	88 (11)
Education	
Less than high school	150 (19)
GED	33 (4)
High school diploma	158 (21)
Trade school certificate ^a	8 (1)
Some college	342 (44)
Undergraduate degree	60 (8)
Some graduate school/grad degree	20 (3)
Current student	
No	315 (41)
Yes	456 (59)
Current employment	
Not employed	289 (38)
Part-time	277 (36)
Full-time	205 (27)
Living situation	
Parents	284 (37)
Alone	95 (12)
Other family members	71 (9)
Roommate	223 (29)
Boyfriend/girlfriend/partner	70 (9)
Shelter/No permanent address	28 (4)
Gender identity	
Cisgender man	709 (92)
Transgender woman	47 (6)
Other	15 (2)
Sexual identity	
Gay	534 (69)

Variable	N (%)
Bisexual	165 (21)
Other	72 (9)
Physical attraction	
Only males	470 (61)
Mostly males, but some females	215 (28)
Males and females equally	51 (7)
Mostly females, but some males	31 (4)
Only females ^b	2 (<1)
Not attracted to anyone ^b	2 (<1)
HIV status	
Negative	619 (80)
Positive	139 (18)
Unknown ^b	13 (2)
Lifetime prevalence combustible cigarettes	
Never	255 (33)
Once or twice	158 (21)
Occasionally	129 (17)
Regularly in the past	70 (9)
Regularly now	159 (21)
Lifetime prevalence electronic cigarettes	
Never	477 (62)
Once or twice	195 (25)
Occasionally	70 (9)
Regularly in the past	18 (2)
Regularly now	11 (1)

Note: Percentages may not sum to 100% due to rounding error. GED = General Education Development degree.

^aDue to its small size, this category was combined with “high school diploma” for the logistic regression analyses.

^bParticipants in this category were excluded from the logistic regression analyses given the small sample size.

Table 2

Univariable and Multivariable Correlates of Cigarette Smoking and E-Cigarette Use

Variable	No. of Smokers/Total No. in Category (%)	Smoker Univariable OR (95% CI)	Smoker ^a Multivariable OR (95% CI)	Smoker ^b Multivariable OR (95% CI)	No. of E-cig Users/Total No. Category in (%)	E-Cigarette User Univariable OR (95% CI)	E-Cigarette User Multivariable OR (95% CI)
Age category							--
16–18 years	19/202 (9)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	9/202 (5)	1.00 (Ref)	
19–21 years	48/263 (18)	2.15^{**} (1.22, 3.79)	2.78^{**} (1.36, 5.67)	2.81^{**} (1.37, 5.76)	8/263 (3)	0.67 (0.26, 1.78)	
22–24 years	56/208 (27)	3.55^{**} (2.02, 6.23)	3.23^{**} (1.48, 7.07)	3.36^{**} (1.53, 7.37)	10/208 (5)	1.08 (0.43, 2.72)	
25–29 years	36/98 (37)	5.59^{**} (2.99, 10.46)	4.57^{**} (1.86, 11.19)	4.70^{**} (1.90, 11.64)	2/98 (2)	0.45 (0.10, 2.11)	
Race/Ethnicity							
White	23/178 (13)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	9/178 (5)	1.00 (Ref)	1.00 (Ref)
Black/African American	71/278 (26)	2.31^{**} (1.38, 3.87)	0.82 (0.42, 1.62)	0.79 (0.40, 1.55)	5/278 (2)	0.34[±] (0.11, 1.04)	0.22[*] (0.06, 0.83)
Hispanic/Latino	45/226 (20)	1.68[±] (0.97, 2.89)	0.96 (0.50, 1.86)	0.95 (0.49, 1.83)	13/226 (6)	1.15 (0.48, 2.75)	1.08 (0.41, 2.81)
Multiracial or Other	19/88 (22)	1.86[±] (0.95, 3.63)	0.98 (0.44, 2.22)	1.07 (0.48, 2.41)	2/88 (2)	0.44 (0.09, 2.07)	0.29 (0.05, 1.60)
Education							
Less than high school	37/150 (25)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	4/150 (3)	1.00 (Ref)	1.00 (Ref)
GED	16/33 (49)	2.87^{**} (1.32, 6.25)	0.76 (0.30, 1.94)	0.90 (0.35, 2.34)	2/33 (6)	2.36 (0.41, 13.43)	3.57 (0.56, 22.80)
High school/trade school	40/166 (24)	0.97 (0.58, 1.62)	0.52 (0.27, 1.01)	0.61 (0.31, 1.18)	9/166 (5)	2.09 (0.63, 6.94)	2.58 (0.70, 9.55)
Some college	53/342 (16)	0.56[*] (0.35, 0.90)	0.28^{**} (0.14, 0.54)	0.31^{**} (0.16, 0.60)	9/342 (3)	0.99 (0.30, 3.26)	1.34 (0.37, 4.91)
Undergraduate degree	9/60 (15)	0.54 (0.24, 1.20)	0.17^{**} (0.06, 0.47)	0.19^{**} (0.07, 0.54)	2/60 (3)	1.26 (0.22, 7.06)	1.42 (0.22, 9.25)
Some graduate school/degree	4/20 (20)	0.76 (0.24, 2.43)	0.22[*] (0.06, 0.87)	0.25[*] (0.06, 0.98)	3/20 (15)	6.44[*] (1.33, 31.24)	8.97[*] (1.55, 51.93)
Current student							
No	102/315 (32)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	13/315 (4)	1.00 (Ref)	--
Yes	57/456 (13)	0.30^{**} (0.21, 0.43)	0.63 (0.38, 1.05)	0.66 (0.40, 1.11)	16/456 (4)	0.85 (0.40, 1.78)	
Current employment							
Not employed	67/289 (23)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	13/289 (5)	1.00 (Ref)	--
Part-time	37/277 (13)	0.51^{**} (0.33, 0.79)	0.81 (0.48, 1.37)	0.77 (0.46, 1.31)	8/277 (3)	0.63 (0.26, 1.55)	
Full-time	55/205 (27)	1.22 (0.80, 1.84)	1.43 (0.83, 2.47)	1.36 (0.79, 2.36)	8/205 (4)	0.86 (0.35, 2.12)	

Variable	No. of Smokers/Total No. in Category (%)	Smoker Univariable OR (95% CI)	Smoker ^a Multivariable OR (95% CI)	Smoker ^b Multivariable OR (95% CI)	No. of E-cig Users/Total No. Category in (%)	E-Cigarette User Univariable OR (95% CI)	E-Cigarette User Multivariable OR (95% CI)
Living situation							
Parents	48/284 (17)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	9/284 (3)	1.00 (Ref)	--
Alone	19/95 (20)	1.23 (0.68, 2.22)	0.82 (0.41, 1.64)	0.81 (0.40, 1.65)	3/95 (3)	0.97 (0.26, 3.76)	
Other family members	21/71 (30)	2.07* (1.14, 3.75)	1.29 (0.66, 2.52)	1.28 (0.64, 2.56)	3/71 (4)	1.35 (0.36, 5.11)	
Roommate	32/223 (14)	0.82 (0.51, 1.34)	1.02 (0.57, 1.80)	1.04 (0.58, 1.85)	11/223 (5)	1.59 (0.65, 3.90)	
Romantic partner	21/70 (30)	2.11* (1.16, 3.83)	1.23 (0.61, 2.47)	1.35 (0.67, 2.73)	1/70 (1)	0.44 (0.06, 3.55)	
Shelter/no permanent address	18/28 (64)	8.85** (3.85, 20.36)	4.87** (1.90, 12.52)	3.80** (1.48, 9.76)	2/28 (7)	2.35 (0.48, 11.46)	
Gender identity							
Cisgender man	136/709 (19)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	24/709 (3)	1.00 (Ref)	1.00 (Ref)
Transgender woman	19/47 (40)	2.86** (1.55, 5.27)	0.98 (0.45, 2.17)	1.56 (0.74, 3.29)	4/47 (9)	2.66* (0.88, 8.00)	4.50* (1.17, 17.30)
Other	4/15 (27)	1.53 (0.48, 4.86)	1.64 (0.42, 6.37)	1.96 (0.52, 7.43)	1/15 (7)	2.04 (0.26, 16.14)	0.97 (0.11, 8.60)
Sexual identity							
Gay	98/534 (18)	1.00 (Ref)	1.00 (Ref)	--	20/534 (4)	1.00 (Ref)	--
Bisexual	39/165 (24)	1.38 (0.90, 2.10)	1.73* (1.05, 2.85)		5/165 (3)	0.80 (0.30, 2.17)	
Other	22/72 (31)	1.96* (1.13, 3.38)	2.19* (1.11, 4.31)		4/72 (6)	1.51 (0.50, 4.56)	
Physical attraction							
Only males	87/470 (19)	1.00 (Ref)	--	1.00 (Ref)	20/470 (4)	1.00 (Ref)	1.00 (Ref)
Mostly males, some females	41/215 (19)	1.04 (0.69, 1.57)		1.42 (0.89, 2.27)	4/215 (2)	0.43 (0.14, 1.26)	0.47 (0.15, 1.44)
Males and females equally	16/51 (31)	2.01* (1.07, 3.80)		2.75** (1.30, 5.84)	0/51 (0) ^c	0.00 (--) ^c	0.00 (--) ^c
Mostly females, some males	15/31 (48)	4.13** (1.97, 8.67)		5.87** (2.46, 13.99)	5/31 (16)	4.33** (1.50, 12.49)	6.38** (1.91, 21.36)
HIV status							
Negative	100/619 (16)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	23/619 (4)	1.00 (Ref)	--
Positive	57/139 (41)	3.61** (2.42, 5.38)	2.80** (1.69, 4.62)	3.06** (1.84, 5.07)	6/139 (4)	1.17 (0.47, 2.93)	

Note: OR = odds ratio. CI = confidence interval. GED = General Education Development degree.

[±] $p < .10$;

^{*} $p < .05$;

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^a *p* .01.

- ^a This analysis regressed cigarette smoking on sexual identity, age, race/ethnicity, education, and HIV status.
- ^b This analysis regressed cigarette smoking on physical attraction, age, race/ethnicity, education, and HIV status.
- ^c Zero participants in this category reported regular e-cigarette use.