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Tobacco harm perceptions and use among sexual and gender minorities: findings from a national sample of young adults in the United States

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Abstract

Introduction—In the United States, the prevalence of tobacco use among sexual and gender minorities (SGM) is higher compared to their non-SGM counterparts. Tobacco harm perceptions have gone largely unexamined as a potential mechanism supporting disproportionate tobacco use among this population. The purpose of this study was to examine differences between SGM and non-SGM young adults in harm perceptions of various tobacco products and tobacco use behavior and whether low tobacco-related harm perceptions moderate the relationship between identifying as a SGM and tobacco use behavior.

Methods—This study used data from Wave 10 of the Truth Initiative Young Adult Cohort Study, a sample of U.S. young adults (ages 18–34). Data were collected from September to October 2016 and the study sample included 3089 individuals. Demographics, past 30-day use of cigarettes, little cigars/cigarillos/bidis and electronic cigarettes were assessed. Absolute and relative harm perceptions of these products were also examined.

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Contributors

OG, ALJ and ACV conceived the study and oversaw data analysis. OG conducted literature searches and drafted the manuscript. ALJ, AC, JR, ACV, DV and KH provided input on manuscript drafts. All authors contributed to and have approved the final manuscript.

Conflict of interest

No competing financial interests exist.

Results—Identifying as a SGM and low tobacco harm perceptions were found to be positively associated with past 30-day tobacco use. There was no interaction between SGM status and harm perceptions on past 30-day tobacco use

Conclusions—Findings confirm that SGM young adults continue to disproportionately use tobacco products, compared to non-SGM young adults. More research is needed to understand moderators of the relationship between SGM status and tobacco use in young adults.

Keywords

Tobacco use; Substance use/abuse; Health disparities; Gender identity; Sexual orientation

1. Introduction

In the United States (US), the prevalence of tobacco use is higher for sexual and gender minorities (SGMs), which includes lesbian, gay, bisexual, transgender (LGBT) and queer individuals (Human Rights Campaign, 2016), compared to their non-SGM counterparts (Agaku et al., 2014; Buchting et al., 2017; Emory et al., 2015; Fallin et al., 2015; Institute of Medicine, 2011; Johnson et al., 2015; Kasza et al., 2017; Lee et al., 2009; Ortiz et al., 2017; Ward et al., 2014; Wheldon et al., 2018). Recent, national data show that 27.3% of heterosexual individuals are current users of any tobacco product while 39.8% and 45.7% of gay/lesbian and bisexual adults are current tobacco users, respectively (Kasza et al., 2017). Another national study found that 45.9% of transgender males and 33.5% transgender females are past 30-day tobacco users, while 28.3% of cisgender males and 22.1% of cisgender females are past 30-day tobacco users (Buchting et al., 2017). Among SGMs, tobacco use is especially prevalent among young adults (ages 18–34) (Johnson et al., 2015; Rath et al., 2013; Wheldon et al., 2018). To date, three studies have examined tobacco use behavior among SGMs using a national sample of young adults. A 2011 study by Rath et al. found that ever and past 30-day use of cigarettes and hookah were significantly higher for lesbian/gay and bisexual respondents and that lesbian/gay respondents reported marginally higher prevalence of ever use of cigars and little cigars/cigarillos/bidis, compared to heterosexual respondents (Rath et al., 2013). Using data from the 2012–2013 National Adult Tobacco Survey, Johnson et al. examined differences in tobacco use between LGBT and heterosexual adults by gender. In sub-analyses of 18–29 year olds, they found that cigarette use was higher for bisexual females, but not lesbian/gay females, compared to heterosexual females. They did not find any differences in tobacco use behavior between gay and bisexual males in comparison to heterosexual male young adults (Johnson et al., 2015). A recent study using data from Wave 1 (2013–2014) of the Population Assessment of Tobacco Use and Health (PATH) study found that among 18–24 year olds, a greater proportion of women who identified as lesbian/gay and bisexual women were regular tobacco users and had greater relative odds of experimental use of cigarettes, e-cigarettes, hookah, cigars and smokeless tobacco compared to heterosexual females (Wheldon et al., 2018). Among 18–24 year old men, gay men had greater odds of regular and experimental use of cigarettes compared to heterosexual men (Wheldon et al., 2018).

Research on the factors associated with greater tobacco use among young adult SGMs is scant (Balsam et al., 2012; Blosnich et al., 2013). A systematic review of the etiology of

tobacco use among lesbian, gay and bisexual individuals identified two sources of tobacco-use disparities among this population: 1) smoking risk factors unique to sexual minorities, such as internalized homophobia, experiences of discrimination; and 2) common risk factors that are more prevalent among sexual minorities, such as stress, depression, anxiety, substance use (Blosnich et al., 2013). Research also suggests that greater exposure to pro-tobacco marketing (Dilley et al., 2008) and higher receptivity to pro-tobacco marketing (Fallin et al., 2015) may be factors related to disproportionate tobacco use among SGMs.

Tobacco harm perceptions have gone largely unexamined as a potential mechanism supporting tobacco use among SGMs. More prevalent peer tobacco use (Jannat-Khah et al., 2017; Blosnich et al., 2013; Remafedi, 2007) and tobacco industry marketing efforts (Dilley et al., 2008; Fallin et al., 2015; U.S. National Cancer Institute, 2017) may alter tobacco harm perceptions among this population by making tobacco use appear more normative. One study used a nationally representative sample of adults to examine differences in risk perceptions of e-cigarettes between lesbian, gay and bisexual (LGB) and heterosexual adults (Nayak et al., 2017). In bivariate analyses, a smaller proportion of LGB adults believed vapors from e-cigarettes to be harmful compared to heterosexual adults. No differences were observed between LGB and heterosexual respondents in terms of relative harm perceptions of e-cigarettes compared to regular cigarettes and absolute harm of e-cigarettes. This study did not examine risk perceptions of other tobacco products and did not present data on young adults specifically (Nayak et al., 2017).

Research demonstrates that in the general population, tobacco harm perceptions are significant correlates and predictors of tobacco use intentions and behaviors among young adults, such that lower harm perceptions of a product are positively associated with product use (Adkison et al., 2013; Villanti et al., 2015; Wackowski and Delnevo, 2016). Specifically, several longitudinal studies have found that beliefs about the health consequences of cigarettes and lower perceptions of harm are predictors of cigarette use (Krosnick et al., 2006; Rodriguez et al., 2007; Song et al., 2009). Data are similar for non-cigarette tobacco products. Cross-sectional data from the National Young Adult Health Survey found that those who perceived a tobacco product as “less risky” than regular cigarettes were more likely to use the corresponding non-cigarette tobacco product (Wackowski and Delnevo, 2016). An earlier longitudinal study in the Truth Initiative Young Adult Cohort found that perceptions of hookah as less harmful than cigarettes predicted subsequent hookah trial in young adults (Villanti et al., 2015).

To fill this gap in the literature, we examined differences between SGM and non-SGM young adults in perceptions of absolute and relative harm of various tobacco products and tobacco use behavior. We also examined whether low tobacco-related harm perceptions moderate the relationship between identifying as a SGM and tobacco use behavior. Given the high rates of tobacco use among SGM young adults, the paucity of data on the mechanisms that support smoking behavior in this population, and the established link between harm perceptions and tobacco use, this study may provide meaningful and generalizable insight into potential reasons for the disproportionate tobacco use among SGM young adults in the US.

2. Methods

This study was approved by Chesapeake IRB, Inc. and online consent was collected from participants before survey self-administration.

2.1. Data

This study uses data from Wave 10 ($n = 4091$; collected September – October 2016) of the Truth Initiative Young Adult Cohort Study, a national, longitudinal sample of young adults, aged 18–34 that is collected approximately every 6-months. The sample was drawn from GfK's KnowledgePanel®, an online panel of adults ages 18 that covers both the online and offline populations in the U.S. Additional information about survey methodology have been reported elsewhere (Cohn et al., 2015). After Wave 1, the sample for each wave consisted of people who completed the previous wave, plus a refreshed sample from the GfK panel, meaning that new individuals were added to the cohort at each wave to maintain sample size and compensate for those lost to attrition (Hirano et al., 2001). Two hundred and twenty-five respondents did not provide information on sexual and gender identity and were excluded from the analysis. An additional 777 respondents were older than 34 years of age and were also excluded from the analysis, resulting in a final sample of 3089 respondents.

2.2. Measures

The primary independent variable of interest was SGM status, which was assessed at study entry. For those who entered the study in Waves 1–8, sexual and gender identity was assessed with the following question: “Do you consider yourself to be: heterosexual or straight, homosexual or gay/lesbian, bisexual, transgender, other, not sure/don't know.” Those who selected “homosexual or gay/lesbian,” “bisexual,” “transgender,” “other” and “not sure/don't know” were categorized as SGMs. In Waves 9 and 10, respondents in the refresh samples were asked two separate questions regarding their sexual and gender identity. First, respondents were asked if they consider themselves to be transgender. Answer choices included “yes, transgender, male to female,” “yes, transgender, female to male,” “yes, transgender, gender non-conforming” and “no.” Participants were then asked: “Do you think of yourself as: straight, gay or lesbian, bisexual, or transgender, transsexual, or gender-non-conforming?” Those who identified as straight/heterosexual were classified as non-SGM, while the remainder of participants were classified as SGM. Respondents who identified as transgender in Wave 10 but also identified as straight/heterosexual were reclassified as SGM ($n=3$). Answer choices to all questions related to sexual and gender identity were mutually exclusive.

2.2.1. Demographics—As part of KnowledgePanel® routine baseline data collection, participants provided information on age at Wave 10, gender, race/ethnicity (White, non-Hispanic; Black, non-Hispanic; Other, non-Hispanic; and Hispanic), and highest education completed (less than high school, high school, and some college or greater). For analyses, race/ethnicity was collapsed into White, non-Hispanic versus other, and highest education completed was collapsed into high school or less versus some college or greater.

2.2.2. Tobacco use—Past 30-day use (yes/no) of cigarettes, little cigars/cigarillos/bidis, and e-cigarettes were examined in this study, since they are the most prevalent tobacco products among young adults (Kasza et al., 2017). Tobacco use was measured at Wave 10.

2.2.3. Harm perceptions—Absolute harm was measured separately for cigarettes and e-cigarettes with the question, “How harmful do you think [product] are to health?” Answer choices included “not at all harmful,” “slightly harmful,” “somewhat harmful,” “very harmful” and “extremely harmful.” For analyses, responses were collapsed into two categories: low harm (“not at all harmful,” “slightly harmful,” or “somewhat harmful”) and high harm (“very harmful” or “extremely harmful”). Relative harm of each non-cigarette tobacco product was assessed with the item “Compared to cigarettes, do you think that the following products are much less harmful to a person’s health, a little less harmful, about the same, a little more harmful, or much more harmful to health?” For analyses, responses were collapsed into two categories: less harmful (“a lot less harmful” or “a little less harmful”), and more harmful/about the same (“about the same,” “a little more harmful” or “a lot more harmful”). Harm perceptions were measured at Wave 10.

2.3. Analysis

Analyses were performed using Stata/IC 14.2 (Stata/IC, 2015) and were weighted to offset non-response bias and produce nationally representative estimates. Prevalence estimates of demographic and tobacco use characteristics were assessed to characterize the sample. Chi-square tests were used to examine differences between SGM and non-SGM respondents on demographic and tobacco use characteristics.

For each tobacco product, separate bivariate modified Poisson regression models were used to examine differences in outcomes (past 30-day tobacco use) by sexual and gender identity and perceptions of harm of a given product (Model 1). Next, separate multivariable models for absolute and relative harm perceptions were run to examine differences in outcomes. Subsequent models included additional covariates: sexual and gender identity and harm perceptions were included in Model 2; demographic characteristics were added in Model 3; and an SGM $\times$ low harm perceptions interaction term was added in Model 4. The robust Poisson regression method was used to avoid over-inflation of the odds ratio given that the prevalence of each of the outcomes was $> 10\%$ in the sample (Barros and Hirakata, 2003).

3. Results

Table 1 describes the demographic and tobacco-related characteristics of the study sample by sexual and gender identity. A total of 9.0% of the sample identified as a SGM. The majority of the sample was aged 25–34 (71.1%), non-Hispanic, White (56.9%), and had at least some college education (67.1%). SGM and non-SGM respondents did not differ on any demographic characteristics.

Harm perceptions and tobacco use among the sample by sexual and gender identity can be found in Table 1. Chi-square tests demonstrate that a greater proportion of SGM respondents perceived e-cigarettes to be less harmful than cigarettes compared to non-SGM respondents (44.6% vs. 37.3%; $p < 0.05$). Past 30-day tobacco use was greater for SGMs across all

products, including cigarettes (28.5% vs 14.5%; $p < 0.001$), LCCs (8.4% vs. 3.7%; $p < 0.01$) and e-cigarettes (8.3% vs. 3.9%; $p < 0.01$).

Results from bivariate and multivariable modified Poisson regression models examining correlates of absolute and relative harm perceptions can be found in Table 2. Sexual and gender identity and harm perceptions were significantly and positively associated with past 30-day tobacco use across all outcomes in Models 1, 2 and 3. Contrary to our hypothesis, none of the interactions between SGM and harm perceptions were statistically significant (Model 4).

4. Discussion

This study adds to the literature through the examination of tobacco harm perceptions as a potential contributor to the disproportionate rates of tobacco use among SGM young adults and by providing recent prevalence estimates of tobacco use among this important population. Results from bivariate analyses found that both SGMs and those with low perceived absolute and relative harm reported higher prevalence of past 30-day tobacco use across all products examined. These relationships remained even after controlling for demographic characteristics. These findings are consistent with other studies, which show that low perceptions of harm (Krosnick et al., 2006; Rodriguez et al., 2007; Song et al., 2009; Villanti et al., 2015; Wackowski and Delnevo, 2016) and sexual and gender identity are associated with higher prevalence of tobacco use (Lee et al., 2009). However, the interaction between SGM status and harm perceptions was not statistically significant in any model. This finding was counter to our a priori hypothesis and suggests that tobacco-related harm perceptions are not differentially higher or lower in the SGM respondents compared to non-SGM respondents when examining the relationships between the two variables and past 30-day tobacco use. Harm perceptions may be a mediator between SGM status and tobacco use, however this analysis was not longitudinal, and this could not be examined.

This study has several limitations. First, data are cross-sectional and thus causal inferences cannot be made. As a result, key smoking-related risk factors that are highly prevalent among SGMs, such as mental health problems, drug and alcohol use and exposure to pro-tobacco marketing (Balsam et al., 2012; Dilley et al., 2008; Institute of Medicine, 2011), were not included in the analyses. These variables are likely influenced by the exposure in our study (sexual and gender identity) on the causal pathway, but could not be examined as mediators due to the cross-sectional nature of the study (DP et al., 2000). Future longitudinal studies should include these risk factors to evaluate whether they mediate the relationship between sexual and gender identity and tobacco use. Additionally, measures for gender and sexual identity were not consistent across study waves. The surveys also did not include measures of sexual attraction and sex assigned at birth, both of which are recommended for surveillance of sexual orientation and gender identity (The GenIUSS Group, 2014; The Williams Institute, 2009). Lastly, our study does not distinguish between perceptions of harm to people in general and perceptions of harm to individuals personally, which could produce different findings, since research shows that people tend to believe that they have a lower risk for experiencing something negative compared to others (Krosnick et al., 2006).

Study findings did not support our hypothesis that harm perceptions moderate the relationship between sexual and gender identity and tobacco use. However, using recent, national data, our study confirms that tobacco-related health disparities by sexual and gender identity persist in the US and highlights the need for tobacco control interventions tailored for SGM populations. Additionally, our study underscores the role of tobacco-related harm perceptions as independent correlates of past 30-day tobacco use and the importance of public education on tobacco-related harms. Longitudinal studies are needed to further examine key mediators and moderators of the relationship between SGM status and tobacco use in young people, including mental health, substance use, and exposure to tobacco marketing.

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HIGHLIGHTS

- The prevalence of tobacco use was higher for sexual and gender (SGM) minorities compared to their non-SGM counterparts.
- Lower absolute harm perceptions of cigarettes and e-cigarettes were associated with past 30-day product use.
- The perception of little cigars/cigarillos/bidis and e-cigarettes as less harmful than cigarettes was associated with past 30-day product use.
- In this study, harm perceptions did not moderate the relationship between identifying as a SGM and tobacco use behavior.

Table 1

Weighted sample characteristics of young adults aged 18–34 (n = 3089) by sexual and gender minority status.

Variable	Total, n (%)	Sexual and Gender Minority, n (%)	Non-Sexual and Gender Minority, n (%)
Overall		273 (9.0)	2816 (90.9)
Age			
18–24	955 (28.9)	78 (25.5)	877 (29.2)
25–34	2134 (71.1)	195 (74.5)	1939 (70.8)
Female	1929 (50.9)	184 (54.6)	1745 (50.5)
Race/ethnicity			
White, non-Hispanic	1997 (56.9)	166 (52.2)	1831 (57.4)
Other	1092 (43.1)	107 (47.8)	985 (42.6)
Education			
High school or less	647 (32.9)	61 (36.3)	586 (32.5)
Some college or greater	2442 (67.1)	212 (63.7)	2230 (67.5)
Absolute harm perceptions ^a			
Cigarettes (low harm)	246 (10.0)	24 (11.0)	222 (9.9)
E-cigarettes (low harm)	1339 (45.4)	140 (51.5)	1199 (44.7)
Relative harm perceptions ^b			
LCC (less harmful)	355 (11.1)	33 (11.6)	322 (11.1)
E-cigarettes (less harmful) *	1231 (38.0)	134 (44.6)	1097 (37.3)
Past 30-day cigarette use ***	417 (15.7)	68 (28.5)	349 (14.5)
Past 30-day LCC use **	140 (4.1)	22 (8.4)	78 (3.7)
Past 30-day e-cigarette use **	113 (4.3)	19 (8.3)	94 (3.9)

Note: Percentages may not add up to 100% due to rounding.

LCC = little cigars/cigarillos/bidis, e-cigarette = electronic cigarette.

Missingness: Absolute harm perceptions of cigarettes (n = 38, 0.9%), absolute harm perceptions of e-cigarettes (n = 46, 1.1%), relative harm perceptions of LCCs (n = 77, 1.9%), relative harm perceptions of e-cigarettes (n = 88, 2.2%). Those with missing data on alcohol, tobacco, marijuana, and other drug use were defined as non-current users.

^a Absolute harm defined as perceiving the product as low harm or high harm.

^b Relative harm defined as perceiving the product as less harmful or more/same level of harm compared to cigarettes.

* p < 0.05.

** p < 0.01.

*** p < 0.001.

Weighted bivariate and modified poisson regression models of sexual and gender identity, absolute and relative harm perceptions and past 30-day tobacco use.

Table 2

Absolute harm perceptions	Past 30-day cigarette use				Past 30-day e-cigarette use			
	Model 1 CPR	Model 2 APR	Model 3 APR	Model 4 APR	Model 1 CPR	Model 2 APR	Model 3 APR	Model 4 APR
	Model 1 APR	Model 2 APR	Model 3 APR	Model 4 APR	Model 1 APR	Model 2 APR	Model 3 APR	Model 4 APR
SGM	1.97 ^{***}	1.92 ^{***}	1.95 ^{***}	2.11 ^{***}	2.13 ^{**}	1.90 [*]	1.93 [*]	3.39
Low harm ^s	4.36 ^{***}	4.32 ^{***}	3.91 ^{***}	4.08 ^{***}	7.70 ^{***}	7.56 ^{***}	7.25 ^{***}	8.24 ^{***}
SGM × low harm	–	–	–	0.77	–	–	–	0.52
Relative harm perceptions	Past 30-day LCC use				Past 30-day e-cigarette use			
	Model 1 CPR	Model 2 APR	Model 3 APR	Model 4 APR	Model 1 CPR	Model 2 APR	Model 3 APR	Model 4 APR
	Model 1 APR	Model 2 APR	Model 3 APR	Model 4 APR	Model 1 APR	Model 2 APR	Model 3 APR	Model 4 APR
SGM	2.28 ^{**}	2.26 ^{**}	2.05 ^{**}	2.10 [*]	2.13 ^{**}	1.95 [*]	1.12 [*]	3.86 ^{**}
Less harmful than cigarettes ^a	2.26 ^{**}	2.25 ^{**}	2.35 ^{**}	2.41 [*]	3.45 ^{***}	3.37 ^{***}	2.40 ^{***}	4.70 ^{***}
SGM × less harmful than cigarettes	–	–	–	0.89	–	–	–	0.33

Model 1: crude prevalence ratio.

Model 2: includes SGM and harm outcome.

Model 3: includes SGM, harm outcome and demographics (age, race/ethnicity, gender and education).

Model 4: includes SGM, harm outcome, demographics (age, race/ethnicity, gender and education) and interaction term between harm (absolute or relative) and sexual and gender identity.

Note: SGM= sexual and gender minority; CPR = crude prevalence ratio; APR =adjusted prevalence ratio.

Missingness: Absolute harm perceptions of cigarettes (n =38, 0.9%), absolute harm perceptions of e-cigarettes (n = 46, 1.1%), relative harm perceptions of e-cigarettes (n =88, 2.2%). Those with missing data on alcohol, tobacco, marijuana, and other drug use were defined as non-current users.

* p < 0.05.

** p < 0.01.

*** p < 0.001.

^aThe product for which harm perceptions were assessed corresponds with the tobacco use outcome.