Preventive Medicine 113 (2018) 109–115

Contents lists available at ScienceDirect

Preventive Medicine

journal homepage: www.elsevier.com/locate/ypmed

Sexual and gender minority cigarette smoking disparities: An analysis of 2016 Behavioral Risk Factor Surveillance System data☆

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ARTICLE INFO

Keywords:
Sexual minorities
Transgender individuals
Tobacco
Smoking
Public health

ABSTRACT

We examined the association between lesbian, gay, bisexual, and transgender (LGBT) identity, cigarette and e-cigarette use, and potential risk factors in the United States. Using data from 198,057 adults in 26 states in the 2016 Behavioral Risk Factor Surveillance System (BRFSS), we estimated the prevalence of cigarette use, e-cigarette use, and potential risk factors by gender identity and sexual identity. Overall and sex-stratified bivariate and multivariate logistic regressions examined whether the relationship between sexual and gender identity and cigarette and e-cigarette use persisted after adjusting for demographics, socio-economic status, and other unhealthy behaviors. After adjusting for covariates, gender minority identity was no longer associated with increased likelihood of currently smoking cigarettes and ever use of e-cigarettes. Sexual minority identity continued to be significant after adjusting for covariates, indicating that sexual identity disparities in cigarette and e-cigarette use are not fully explained by these factors. Findings varied by identity. Compared to their straight peers, likelihood of tobacco product use among LGB individuals varied between sexes, by product, and by sexual identity (gay/lesbian versus bisexual). More research is needed to understand the mechanisms that influence diverse patterns of cigarette and e-cigarette use among sexual and gender minority adults.

1. Introduction

Lesbian, gay, bisexual, and transgender (LGBT) populations are more likely to use tobacco compared to those who are not LGBT (King et al., 2012). Previous research has largely focused on sexual minority adults in particular; those who identify as lesbian, gay, or bisexual, or have another non-straight identity (LGB). This research indicates that tobacco use is higher among LGB adults compared to straight adults. However, sexual identity disparities in tobacco use differ by sex and product (Agaku et al., 2014; Lee et al., 2009; Johnson et al., 2016; Max et al., 2016; Phillips et al., 2017; Hu et al., 2016; Weaver et al., 2016; Pericot-Valverde et al., 2017; Sharapova et al., 2018; Ortiz et al., 2017; Emory et al., 2016; Majeed et al., 2017; Gonzales and Henning-Smith, 2017a; Jamal et al., 2016; Jamal et al., 2018). Literature is mixed on the influence of gender minority status; transgender adults also report elevated rates of smoking (Shires and Jaffee, 2016; Buchting and Emory, 2017; Meyer et al., 2017) relative to their non-gender minority (i.e., cisgender) counterparts, though research to date has largely been limited by small sample sizes.

Tobacco use disparities may be influenced by LGBT-targeted tobacco marketing, a strategy with origins dating back to the early nineties (Dilley et al., 2008; Smith and Malone, 2003; Stevens et al., 2004; Smith et al., 2008). Other factors also contribute to LGBT tobacco use disparities. Sexual minority identity is associated with a higher overall mortality rate between ages 18 to 59 (Cochran et al., 2016), worse overall health (Cochran et al., 2016; Branstrom et al., 2016; Elliott et al., 2015), elevated rates of depression and other mental health issues (Gonzales and Henning-Smith, 2017a; Cochran et al., 2016; Conron et al., 2010; Blosnich et al., 2013; McLaughlin et al., 2012; Grant et al., 2010), illicit drug use and substance abuse (Conron et al., 2010; Grant et al., 2010; Corliss et al., 2010), and alcohol use and binge drinking (Gonzales and Henning-Smith, 2017a; Cochran et al., 2016; Conron et al., 2010); all factors also associated with tobacco use (Shires and Jaffee, 2016; Blosnich et al., 2013; McLaughlin et al., 2012). Transgender identity is also associated with healthcare barriers and poor general, physical, and mental health (Meyer et al., 2017; Motwani

Abbreviations: AOR, Adjusted odds ratio; BRFSS, Behavioral risk factor surveillance system; CDC, Centers for Disease Control and Prevention; CI, 95% confidence interval; LGBT, Lesbian, gay, bisexual, and transgender; UOR, Unadjusted odds ratio

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The authors declare there is no conflict of interest.

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https://doi.org/10.1016/j.ypmed.2018.05.014
Received 13 October 2017; Received in revised form 8 May 2018; Accepted 11 May 2018
Available online 12 May 2018
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and Fatehchehr, 2017; Gonzales and Henning-Smith, 2017b; Herman et al., 2017). This constellation of factors is attributed, in part, to the stress associated with possessing a devalued, minority status, including an increased likelihood of experiencing stigmatization, discrimination (Cochran et al., 2016; Grant et al., 2010; Blondeel et al., 2016; Reisner et al., 2016), and homelessness (McLaughlin et al., 2012)—collectively known as minority stress (Gruskin et al., 2008) (Hatzenbuehler et al., 2014). As more data become available, analyses of this tobacco disparity are becoming more complex, adjusting for socio-demographics and socio-economic status (SES) (Max et al., 2016; Ortiz et al., 2017; Emory et al., 2016) as well as other factors such as health status, and use of other tobacco products (Weaver et al., 2016; Pericot-Valverde et al., 2017; Majeed et al., 2017); however, most have not yet included unhealthy behaviors and minority stress-related factors.

The Behavioral Risk Factor Surveillance System (BRFSS) study is one of the first large-scale studies in the U.S. to include gender identity and sexual identity measures, providing an important opportunity to build on what is known about sexual and gender minority tobacco use. The current study seeks to use BRFSS data to compare cigarette and e-cigarette use prevalence between (1) sexual minority and straight and (2) transgender and cisgender adults overall and segmented by sex, adjusted for factors associated with tobacco use including those related to minority stress, demographics, and socioeconomic status (SES). Tobacco use rates differ when comparing LGB adults with their straight peers of the same sex (Johnson et al., 2016; Cochran et al., 2016; Blosnich et al., 2013; Fallin et al., 2015; Lindley et al., 2012), which supports stratifying by sex when examining disparities among LGBT individuals. For each sex group, sexual minority and transgender cigarette and e-cigarette use are compared against use by their straight and cisgender peers, using a model with the above-noted constellation of factors to examine if disparities persist after adjusting for factors found in extant research.

2. Methods

The Centers for Disease Control and Prevention (CDC), in partnership with state, territory, and commonwealth health departments, conducts the BRFSS annually among the noninstitutionalized adult population who provided informed consent nationally using a cross-sectional, random-digit-dial (RDD) design that includes both landline and cell phone numbers. In 2016, a total of 486,303 interviews were conducted. The dataset and accompanying information on the study design, questionnaires, and weighting methodology are publicly available online (Centers for Disease Control and Prevention, 2014). Twenty-six states opted to include the BRFSS Sexual and Gender identity optional module as part of their survey in 2016. From this group, 7214 individuals were excluded because they selected “don't know/not sure”, refused to answer, or selected “other” for any of these three measures; resulting in a study sample of 205,271 respondents with information on their sex, sexual identity, and gender identity. Though this sample is not nationally representative, it is one of the larger datasets available that includes both sexual and gender identity, and therefore provides new opportunities for insight.

2.1. Measures

Gender identity was assessed with two items. The first asked, “Do you consider yourself to be transgender?”. Respondents answering “Yes” to the first question were then asked, “Do you consider yourself to be 1. Male-to-female, 2. Female-to-male, or 3. Gender non-conforming?”. Response options to the second question included: “Yes, Transgender, Male-to-female” (n = 324); “Yes, Transgender, Female-to-male” (n = 237); “Yes, Transgender, Gender non-conforming” (n = 147); or “No”. Other response options “Don't know/Not sure”; and “Refused” were excluded from the sample.

Sexual identity was assessed by having respondents select from a list of sexual identities including: “Straight,” “Lesbian or gay,” and “Bisexual,”. Sexual minority identity includes those who identified as lesbian, gay, or bisexual. Other response options: “Other,” “Don't know/Not sure,” and “Refused” had been excluded from the sample.

The measure we refer to as sex was assessed based on self-report to the question, “Are you….?” with the options “Male”, “Female”, or Refused. Those who had refused to answer were excluded from the sample.

Smoking behavior was assessed in two ways: (1) ever smoking, defined as having smoked at least 100 cigarettes in one's lifetime; and (2) current cigarette smoking, defined as ever smoking and now smoking every day or some days. Ever e-cigarette use was indicated by answering yes to the following question, “Have you ever used an e-cigarette or other electronic ‘vaping’ product, even just one time, in your life?” Among ever e-cigarette users, current use was indicated by reporting using e-cigarettes every day or some days.

Binge drinking was defined as having consumed at least 4+ alcoholic drinks among female participants and 5+ drinks among male participants on one occasion in the past 30 days. Those who answered “Yes” to the question “Has a doctor, nurse, or other health professional ever told you that you have a depressive disorder, including depression, major depression, dysthymia, or minor depression?” were coded as ever having a diagnosed depressive disorder. Another unhealthy behavior, lack of exercise, was defined as answering “No” to the question “During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?”.

Demographic and socio-economic data included age (18–24, 25–34, 35–44, 45–54, 55–64, or 65+); race and ethnicity; education level (high school or equivalent or less, some college or post high school certificates, or college or more); employment (being unemployed or being employed, and being a student, retired, or a homemaker); and annual household income (< $15,000, $15,000– < $25,000, $25,000– < $35,000, $35,000– < $50,000, or ≥$50,000).

2.2. Statistical analyses

The analysis was conducted in IBM© SPSS© Statistics Version 24.0 among the subsample who were asked gender and sexual identity module questions and provided a response other than “other” or “don't know/not sure”. The analysis was conducted using BRFSS national weights. We described the analytical sample by cigarette smoking, e-cigarette use, sexual and gender identity, demographics, socio-economic status, and other unhealthly behaviors (e.g., alcohol binging, lack of exercise). We segmented the sample to facilitate two comparisons: sexual minorities versus straight adults and those who were transgender versus their cisgender peers. We conducted bivariate comparisons and multivariate logistic regressions with lifetime (100+) and current cigarette smoking as well as ever and current e-cigarette use as the dependent variables to test for tobacco use disparities by sexual and gender minority status overall and by sex (females and males).

3. Results

3.1. Demographics, socio-economic status, cigarette, and e-cigarette use

Sample characteristics are described in Table 1. Sexual minorities represent 3.26% (n = 6450) and transgender adults 0.36% (n = 708) of the analytical sample. More sexual minorities reported being transgender compared to straight adults and more transgender adults reported being sexual minorities compared to cisgender adults. Depressive disorder diagnosis was higher among sexual minorities and transgender adults in comparison to their peers. Binge drinking was more common among sexual minorities than those who are straight. More sexual minority (versus straight) and cisgender (versus

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