


Use of electronic nicotine delivery systems (ENDS) in lesbian, gay, bisexual, transgender and queer persons: Implications for public health nursing

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Abstract

Smoking and rates of tobacco abuse remain higher in lesbian, gay, bisexual, transgender, and queer (LGBTQ) persons. There has been very little scholarly inquiry about the emerging trend of use of electronic nicotine delivery systems (ENDS; e.g., vaping and eCigarettes [eCigs]) in LGBTQ populations. The purpose of this article is to: (a) explore the most recent prevalence data regarding smoking and tobacco abuse in LGBTQ persons, (b) reveal strategies the tobacco industry has historically used in marketing their products to the LGBTQ community, (c) review data from the few studies evaluating use of ENDS in LGBTQ persons, (d) provide evidence-based methods public health nurses can employ to discourage use of ENDS in LGBTQ persons by addressing two identified causes of ENDS use in LGBTQ populations (harassment/discrimination in LGBTQ youth and binge drinking in LGBTQ adults), and (5) encourage cessation among those already using ENDS.

KEYWORDS

bisexual, eCigarettes, gay, homosexual, lesbian, LGBTQ, queer, smoking, transgender, vape

1 | INTRODUCTION

Smoking and tobacco abuse continue to be a major threat to the health of lesbian, gay, bisexual, transgender, and queer (LGBTQ) persons (Buchting et al., 2017; CDC, 2018a, 2018b). While overall rates of smoking in the general population have been declining (CDC, 2019b), the rates of use of electronic nicotine delivery systems (ENDS; e.g., vaping and eCigarettes [eCigs]) have been increasing in recent years (Truth Initiative, 2019). Despite this overall trend nationwide, there has been very little scholarly inquiry about the emerging trend of use of ENDS in LGBTQ populations.

1.1 | Literature review strategy

To complete the literature review used for completion of this article, a search was conducted using CINAHL Plus with Full Text, Academic Search Premier, APA PsycInfo, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, and MEDLINE for studies published between January 2009 and August 2019. The following combination of search terms was used: ((MH "Gay Persons+") OR GLBT* OR (MH "GLBT Persons+") OR (MH "Transgender Persons+") OR (MH "Bisexuals") OR lesbian* or gay* or homosexual* or bisexual* or transgender* or homosexual* or queer* or "sexual minorit*" or "Gender Minorit*") AND ((MH "Electronic Cigarettes")

or vaping or vape or "electronic cigarette*" or e-cigarette* or electronic nicotine). One hundred and fifty-eight records were retrieved, of which 81 were duplicates, leaving 77 unique records, which were reviewed for relevance to the focus of the article. Government and other organizational resources were also used.

1.2 | Purpose

The purpose of this article is to: (a) explore the most recent prevalence data regarding smoking and tobacco abuse in LGBTQ persons, (b) reveal strategies the tobacco industry has historically used in marketing their products to the LGBTQ community, (c) review data from the few studies evaluating use of ENDS in LGBTQ persons, (d) provide evidence-based methods public health nurses can employ to discourage use of ENDS in LGBTQ persons by addressing two identified causes of ENDS use in LGBTQ populations (harassment/discrimination in LGBTQ youth and binge drinking in LGBTQ adults), and (e) encourage cessation among those already using ENDS.

2 | VAPING AND ECIGARETTE USE: AN EMERGING AND CONCERNING TREND

Cigarette smoking remains the leading cause of preventable disease and death in the United States. Mortality data from 2017 attributed 480,000 deaths to smoking, equating to about 20% of all U.S. deaths (Centers for Disease Control & Prevention [CDC], 2019b). Over 34 million U.S. adults smoke cigarettes; and greater than 16 million have a smoking-related disease (CDC, 2019b). Luckily, rates are declining. Between 2005 and 2017, rates dropped from almost 21% to 14%, with higher rates of smoking cessation as well (CDC, 2019b).

Despite the national wane in cigarette smoking, popularity in the use of ENDS—such as vaporized nicotine products (vapes) and electronic cigarettes (eCigs)—is rising, particularly in the adolescent population (National Institutes of Health, 2018). Between 2017 and 2018, the rates of past-30-day nicotine vaping in 12th grade students doubled from 11% to 21%; ENDS were also the key driver of overall increased use of tobacco within this population (University of Michigan Institute for Social Research, 2018). Often flavored with tastes that are enticing to younger users, ENDS are leading to nicotine addiction in a new generation and reversing the downward trend of overall nicotine use in the United States (Hopkins Medicine, 2019).

The multiple health-related implications of ENDS have widespread impacts on public health. Little is known about the chemical additives in vapes/eCigs and the possible ill-health effects of those chemicals, particularly with long-term use (Hopkins Medicine, 2019). Vapes/eCigs are just as addictive as traditional cigarettes and are often misperceived as effective smoking cessation tools. However, data suggest most people attempting to quit cigarette smoking using ENDS eventually adopt both behaviors (Hopkins Medicine, 2019). Between June 28, 2019 and August 20, 2019, the CDC (2019a)

linked use of ENDS to severe acute pulmonary presentations in 193 persons in 22 states, prompting state health departments, the CDC, and U.S. Food and Drug Administration to expand epidemiologic investigations into the prevalence and incidence of ENDS-associated severe pulmonary disease (CDC, 2019a).

Consequently, the use of ENDS is an emerging public health issue that warrants serious focus by public health nurses and clinicians. Because smoking rates in lesbian, gay, bisexual, transgender, and queer (LGBTQ) persons have traditionally been significantly higher than heterosexuals (CDC, 2018b), assessment of this population's use of ENDS is vital, particularly with recent inquiries indicating they are more likely to use these devices (Spears et al., 2019). Thus, it is essential to evaluate the prevalence and incidence rates of smoking and ENDS use in the LGTBQ population.

3 | PREVALENCE OF SMOKING AND ENDS USE IN LGBTQ PERSONS

Data from the 2016 National Health Interview Survey of adults aged 18 or greater indicated the overall rate of cigarette smoking in LGB persons was 20.5% (CDC, 2018a, 2018b). This rate was 1.34 times the rate of 15.3% observed in heterosexual respondents (CDC, 2018a, 2018b). Data assessing smoking prevalence in transgender persons are scarce; but those that do exist suggest that, like their LGB peers, transgender populations also have higher prevalence rates of smoking (CDC, Buchting et al., 2017; 2018b). Buchting and colleagues, for example, found a 35.5% rate of cigarette smoking in their sample of transgender persons; this was almost 15% higher than the 20.7% rate they reported for cisgender individuals (2017). Data are lacking examining smoking in specific LGBTQ communities. For example, a systematic literature review failed to find higher rates of smoking in the bear community; but the overall conclusion from that study suggested there were few inquiries assessing health risks in this community and more research was needed (Quidley-Rodriguez & De Santis, 2016). Because ENDS usage is somewhat new, the science assessing use of ENDS in LGBTQ persons is somewhat scarce.

Gerend, Newcomb, and Mustanski (2017) found a smoking rate of 21% in their national sample of young men who have sex with men and transgender women ($N = 771$). While 40% had reported ever-tried use of an eCig, regular use of eCigs among the sample was low at just 3.8% (Gerend, Newcomb, Mustanski, 2017). The authors concluded that eCig users were more likely to be transgender women, White, more educated, and mostly attracted to females. These findings were similar to those of Spears et al. (2019), who found ENDS users were more likely to be non-Black, younger, sexual minorities, living at or above poverty (ever use), with higher education (current use).

Nayak, Salazar, Kota, and Paechacek (2017) also found rates of ENDS use to be higher in LGB adults compared to heterosexual adults. In their large U.S.-based sample ($N = 11,525$), LGB adults were 1.5 times more likely to have ever used ENDS than heterosexual adults. Another finding from their study revealed significant

differences in perceptions of harm from ENDS among LGB adults versus heterosexual adults. Among the LGB participants, 16.7% believed exposure to vapors from ENDS was "harmful" or reported they "did not know" of any harm from exposure to ENDS compared to 19.2% in heterosexual adults. Similarly, results from a regional study by Tami-Maury and associates showed a high prevalence of smoking and ENDS use among their LGBTQ sample; however, these persons failed to identify smoking as a major health issue (2015).

While nationally representative surveys assessing smoking use need to expand their capture of smoking behaviors to include use of ENDS and participants' sexual orientation and gender identity (Azagba, Latham, & Shan, 2019), the data that exist strongly suggest higher use among LGBTQ persons (Mirbolouk et al., 2018). This suggests the need for interventions aimed at helping those currently using ENDS to quit while focusing interventions on causative factors to discourage nonusers from starting. Therefore, a closer look at what etiologic factors result in higher use of ENDS by LGBTQ persons is warranted. Table 1 provides a summary of U.S. nationally representative studies reporting prevalence rates of smoking among LGBTQ populations included in this review.

3.1 | Factors contributing to increased use of ENDS in LGBTQ populations

Large, nationally representative studies have shown sociodemographic characteristics such as youth, poverty, lower education, and being Black or Hispanic as being correlates of ENDS use in the general population. However, this review highlighted some contrasting findings among LGBTQ ENDS users; and there are some unique contributing factors linked to use of ENDS among LGBTQ persons (Spears et al., 2019). For example, while Fallin-Bennett and collaborators found higher use of ENDS in both lesbian/bi women and gay/bi men compared to heterosexual men and women, their findings also suggested binge drinking was associated with ENDS use in their LGB participants (2017).

This is a significant finding because some studies have demonstrated statistically higher use of alcohol among LGBTQ persons compared to heterosexuals (Bryan, Hyun-Jun, & Fredriksen-Goldman, 2017; Hatzenbuehler, Corbin, & Fromme, 2008; Hughes, Wilsnack, & Kantor, 2016; Wong, Kipke, & Weiss, 2008), which could suggest higher rates of drinking in LGBTQ persons could lead to increase ENDS use (or vice versa). Because youth are at higher risk for use of ENDS, Coulter and his team researched usage of ENDS and other substances among a sample of LGBTQ youth (2018). Their findings suggested gender- and sexuality-based harassment on LGBTQ persons had positive interactions with rates of substance abuse, including ENDS. Specifically, they concluded gender- and sexuality-based harassment contributed to use of ENDS by 11th graders (Coulter, Bersamin, Russell, & Mair, 2018). LGBTQ youth are subjected to bullying, harassment, disproportionate amounts of stress, and violence at significantly higher rates than their heterosexual counterparts (Azagba et al., 2019; Berlan, Corliss, Field, Goodman, &

Austin, 2010; Marx & Kettrey, 2016; Schneider, O'Donnell, Stueve, & Coulter, 2012). Hinds, Loukas, and Perry reiterate the suggestion LGBTQ persons are more likely to start using ENDS at a younger age compared to heterosexuals; their data support initiation of ENDS usage in LGBTQ persons in Texas at an age that is 1.34 years younger than heterosexuals (2018).

Because the literature abundantly supports earlier adoption and higher prevalence of ENDS use in LGBTQ adolescents and LGBTQ youth, it is important to identify this subgroup as a major public health target. It is also vital to examine the strategies tobacco companies have used to target their products to LGBTQ persons in general. This is because many of the most popular ENDS product manufacturers are actually subsidiary companies of larger tobacco companies; and the tobacco industry is marketing ENDS products to appeal to LGBTQ persons directly (e.g., see Delmonte, 2015). Because of this, it is vital to examine the traditional and more modern ways in which this industry continues to recruit LGBTQ persons to begin use of their products and facilitates continued usage among LGBTQ persons already using them.

4 | MARKETING STRATEGIES USED BY THE TOBACCO INDUSTRY TO TARGET THE LGBTQ COMMUNITY

The Federal Trade Commission (2016) reported that ENDS companies consistently increased their marketing expenditures from \$75.7 million in 2013 to \$115.3 million in 2014 for e-cigarettes and from \$503.2 million in 2013 to \$600.8 million in 2014 for all other smokeless tobacco products. Between 2010 and 2014, e-cigarettes were the second most advertised tobacco product in magazines (16%), behind combustible cigarettes (55%), with an average increase of two new ads every year (El-Touky & Choi, 2016).

In 2016, the U.S. Food and Drug Administration finalized a rule extending its regulatory authority to all tobacco products, including ENDS. Even though this new rule requires health-warning labels for all tobacco products, it does not impose additional restrictions on ENDS marketing (United States Food and Drug Administration, 2016). Given the lack of regulation on marketing of ENDS in the United States and the increasing exchange of ENDS-related information online, Collins, Glasser, Abudayyeh, Pearson, and Villanti (2019) reviewed ENDS companies' marketing strategies and the public engagement with this information. Their review of 124 publications found: (a) marketing expenditures and online engagement with ENDS through social media have significantly increased over time, (b) marketing of ENDS often frames them as a safe alternative to combustible cigarettes, and (c) ENDS advertisement exposure may be associated with adolescents and young adults trying ENDS for the first time.

While most of the research narrative of ENDS marketing strategies show a clear target towards the adolescent and young adult demographic (cf. Walley, Wilson, Winickoff, & Groner, 2019), only a handful of studies have examined the

TABLE 1 Summary of U.S. nationally representative studies reporting prevalence rates of smoking among LGBTQ populations

Author(s), year	Data source	Population	Outcome	Prevalence rate
Emory et al. (2016)	2013 TCME	U.S. adults \geq 18 yo	Current use of any tobacco product	Non-LGB 24.7% LGB 35.7%
			Current use of eCigs	Non-LGB 4.8% LGB 8.9%
Hu et al. (2016)	2013–2014 NATS	Persons aged \geq 18 yo who reported tobacco product use “every day” or “some days”	Any tobacco product	Hetero 20.7% LGB 32.1% NS 22.3%
			eCigs	Hetero 3.3% LGB 6.9% NS 2.6%
Huang, Kim, Vera, and Emery (2016)	GfK’s KnowledgePanel®	U.S. adults \geq 18 yo	Current cigarette smoker	Hetero 20.3% LGB + Trans 32.4% NS 12.2%
			Lifetime use of eCigs	Hetero 14.3% LGB + Trans 25.1% NS 9.1%
			Current use of eCigs	Hetero 4.9% LGB + Trans 9.4% NS 3.0%
Johnson et al. (2016)	2012–2013 NATS	U.S. adults \geq 18 yo	Current cigarette smoking (δ)	Hetero 20.5% Gay 26.1% Bisex 20.7%
			Current cigarette smoking (φ)	Hetero 14.3% Lesbian 22.2% Bisex 36.0%
			Current eCigs use (δ)	Hetero 4.7% SGM 7.9%
			Current eCigs use (φ)	Hetero 3.4% SGM 12.4%
Kann et al. (2016)	2015 National YRBS	U.S. students in grades 9–12	Currently uses any tobacco product	Hetero 30.3% LGB 40.5% NS 33.7%
			Ever vaped	Hetero 44.2% LGB 53.5% NS 43.6%
			Currently vapes	Hetero 23.4% LGB 29.2% NS 26.8%
Buchting et al. (2017)	2013 GfK’s KnowledgePanel®	U.S. adults \geq 18 yo	Past-30-day use of any tobacco product	Cis 25.1% Trans 39.7%
			Past-30-day use of eCigs	Cis 5.0% Trans 21.3%
Dai (2017)	2015 National YRBS	U.S. students in grades 9–12	Any tobacco product	Hetero 29.6% LG 40.5% Bisex 38.5% NS 32.2%
			eCigs	Hetero 23.4% LG 26.6% Bisex 30.0% NS 26.8%

(Continues)

TABLE 1 (Continued)

Author(s), year	Data source	Population	Outcome	Prevalence rate
Kasza et al. (2017)	Wave 1 of the 2013–2014 PATH	Persons ≥ 12 yo in the United States	Current use of any tobacco product (youth)	Hetero 11.8% Bisex 29.8% LG 25.6% NS 9.8%
			Current use of any tobacco product (adults)	Hetero 27.3% Bisex 45.7% LG 39.8% NS 26.4%
			Current use of eCigs (youth)	Hetero 4.2% Bisex 9.7% LG 13.4% NS –
			Current use of eCigs (adults)	Hetero 5.3% Bisex 12.6% LG 12.2% NS 6.6%
Phillips et al. (2017)	2015 NHIS	Persons aged ≥ 18 yo who reported tobacco product use “every day” or “some days”	Any tobacco product	Hetero 20.1% LGB 27.4%
			eCigs	Hetero 3.4% LGB 8.9%
Caputi, Smith, Strathdee, and Ayers (2018)	2015 National YRBS	U.S. students in grades 9–12	Past-30-day tobacco use (δ)	SGM 18.9% Gay 13.8% Bisex 15.6% Q 25.7% Hetero 15.8%
			Past-30-day tobacco use (φ)	SGM 15.7% Lesbian 15.0% Bisex 18.2% Q 9.5% Hetero 7.7%
			Ever vaped (δ)	SGM 39.6% Gay 41.1% Bisex 39.0% Q 46.4% Hetero 41.4%
			Ever vaped (φ)	SGM 55.9% Lesbian 56.9% Bisex 59.3% Q 38.7% Hetero 46.5%
			Past-30-day vaping (δ)	SGM 26.4% Gay 22.7% Bisex 23.7% Q 31.7% Hetero 25.4%
			Past-30-day vaping (φ)	SGM 29.4% Lesbian 30.7% Bisex 31.6% Q 22.9% Hetero 21.0%

(Continues)

TABLE 1 (Continued)

Author(s), year	Data source	Population	Outcome	Prevalence rate
Caputi et al. (2018)	2015 National YRBS	U.S. students in grades 9–12	Lifetime use of cigarettes	Hetero 30.5% LGB + Q 47.3%
			Past 30-day use of cigarettes	Hetero 9.8% LGB + Q 17.9%
			Lifetime use of eCigs	Hetero 44.2% LGB + Q 50.7%
			Past 30-day use of eCigs	Hetero 23.4% LGB + Q 28.5%
Ganz et al. (2018)	Wave 10 of the Truth Initiative Young Adult Cohort Study	U.S. young adults 18–34 yo	Past 30-day use of eCigs	Non-SGM 3.9% SGM 8.3%
Hoffman, Delahanty, Johnson, and Zhao (2018)	2016 BRFSS	Noninstitutionalized U.S. adult population	Current cigarette smoker	LGB 21.8% Straight 14.6% Trans 21.0% Cis 14.8%
			Lifetime eCigs use	LGB 36.5% Straight 18.1% Trans 16.0% Cis 18.8%
			Current eCigs use	LGB 22.3% Straight 19.7% Trans 27.8% Cis 19.8%
Wang et al. (2018)	2017 NHIS	Persons aged ≥ 18 yo who reported tobacco product use "every day" or "some days"	Any tobacco product	Hetero 19.0% LGB 27.3%
			eCigs	Hetero 2.6% LGB 7.5%
Wheldon, Kaufman, Kasza, and Moser (2018)	Wave 1 of the 2013–2014 PATH	Persons ≥ 12 yo residing in the United States	Regular use of any tobacco product	Hetero 24.8% LG 47.5% Bisex 57.4% NS 30.0%
			Regular use of eCigs	Hetero 3.3% LG 6.3% Bisex 8.9% NS 9.7%
Azagba et al. (2019)	2015 National YRBS	U.S. students in grades 9–12	Cigarette smoking	Hetero 7.0% LG 16.8% Bisex 15.7% NS 12.0%
			eCigs use	Hetero 12.5% LG 18.9% Bisex 15.4% NS 12.0%

(Continues)

TABLE 1 (Continued)

Author(s), year	Data source	Population	Outcome	Prevalence rate
Delahanty et al. (2019)	FDA's This Free Life	LGB + Trans young adults 18–24 yo	Lifetime tobacco use	Cis G♂ 87.8% Cis Bisex ♂ 87.9% Cis L ♀ 93.4% Cis Bisex ♀ 90.7% SGM 89.9%
			Past-30-day tobacco use	Cis G♂ 57.6% Cis Bisex ♂ 56.3% Cis L ♀ 66.8% Cis Bisex ♀ 62.6% SGM 64.3%
			Lifetime eCigs use	Cis G♂ 51.1% Cis Bisex ♂ 55.1% Cis L ♀ 58.1% Cis Bisex ♀ 60.7% SGM 57.7%
			Past-30- eCigs use	Cis G♂ 22.4% Cis Bisex ♂ 29.9% Cis L ♀ 28.5% Cis Bisex ♀ 29.4% SGM 24.2%
Emory et al. (2019)	GfK's KnowledgePanel®	U.S. adults ≥ 18 yo	Past 30-day cigarette use	LGB + Trans 32.6% Hetero 20.1%
			Past 30-day eCigs use	LGB + Trans 10.8% Hetero 4.8%
Johnson et al. (2019)	Wave 3 of the 2015–2016 PATH	Persons ≥ 12 yo in the United States	Lifetime tobacco use	Cis 31.5% Trans 53.6% SGM ♂ 41.3% Hetero ♂ 32.1% SGM ♀ 46.9% Hetero ♀ 28.1%
			Past-30-day tobacco use	Cis 3.5% Trans 10.2% SGM ♂ 6.3% Hetero ♂ 4.1% SGM ♀ 6.1% Hetero ♀ 2.5%
			Lifetime eCigs use	Cis 23.0% Trans 40.2% SGM ♂ 27.9% Hetero ♂ 23.3% SGM ♀ 37.9% Hetero ♀ 20.1%
			Past-30- eCigs use	Cis 5.6% Trans 17.4% SGM ♂ 6.3% Hetero ♂ 6.0% SGM ♀ 10.4% Hetero ♀ 4.6%
Spears et al. (2019)	2016 and 2017 Tobacco Products and Risk Perceptions Surveys	Noninstitutionalized U.S. adults	Current user of noncigarette combustible tobacco	SGM 14.2% Hetero 9.2%
			Current cigarette smoker	SGM 22.8% Hetero 13.4%
Wheldon and Wiseman (2019)	Wave 2 of the 2014–2015 PATH	Persons ≥ 12 yo in the United States	Regular use of any tobacco product	Cis 23.6% Trans 32.6%
			Regular use of eCigs	Cis 6.5% Trans 12.4%

(Continues)

TABLE 1 (Continued)

Author(s), year	Data source	Population	Outcome	Prevalence rate
Wheldon et al. (2018)	2015 HINTS-FDA 1 and 2017 HINTS-FDA 2	Noninstitutionalized U.S. adult population	Established cigarette/cigar use	SGM 57.4% Hetero 40.8%
			Lifetime use of other tobacco products (hookah, pipe, roll your own, snus, eCigs)	SGM 71.6% Hetero 41.5%

Abbreviations: ♀, female; ♂, male; BRFSS, Behavioral Risk Factor Surveillance System; cis, cisgender; eCigs, electronic cigarettes; hetero, heterosexual; HINTS-FDA, U.S. National Cancer Institute's Health Information National Trends Survey, Food and Drug Administration; LGB, lesbian, gay, and bisexual; NATS, National Adult Tobacco Survey; NHIS, National Health Interview Survey; NS, not specified; PATH, Population Assessment of Tobacco and Health; Q, questioning; SGM: sexual and gender minority; TCME, Tobacco in a Changing Media Environment; trans, transgender; US, United States; yo, years old; YRBS, Youth Risk Behavior Survey.

approach to and engagement by LGBTQ populations. This is problematic considering the tobacco industry has routinely tailored advertisements to LGBTQ as well as placed those advertisements in media sources primarily consumed by LGBTQ individuals. Thus, the actual extent to which LGBTQ and non-LGBTQ persons are differentially exposed to tobacco-related content on traditional and new media remains particularly unclear. In a recent study, Emory, Buchting, Trinidad, Vera, and Emery (2019) found that LGBTQ participants—particularly LGBTQ smokers—were more likely to be exposed to and interact with tobacco-related messages on both traditional and new social media than their non-LGBTQ counterparts. In addition, these higher levels of tobacco media exposure were significantly associated with higher likelihood of tobacco use (Emory et al., 2019).

Regarding supportive messaging for tobacco cessation, evidence suggests LGBTQ populations are more frequently exposed to generalized antitobacco messaging rather than LGBTQ-targeted messages on LGBTQ-specific media sources (Matthews et al., 2016). Fallin, Lee, Bennett, and Goodin (2016) analyzed data from the 2009–2010 National Adult Tobacco Survey, finding that the majority of both LGBTQ and non-LGBTQ participants had seen at least one tobacco cessation ad in the past 30 days (ranging from 86.2% to 95.6%), and did not observe significant differences between groups. However, the same study indicated that among current smokers, gay and bisexual adult men reported less awareness of smoking quitlines compared to their heterosexual counterparts. No such differences by sexual orientation were found for females (Fallin et al., 2016).

The tangled nature of reporting marketing of nicotine products, either as combustible cigarettes or ENDS is not limited to exposure. This review found that combustible tobacco companies are purchasing large interests in ENDS manufacturers and, thus, will cross-lobby for the marketing of these products (Table 2). Regardless of the mechanisms that promote the initiation or sustained use of ENDS by LGBTQ persons, public health nurses and other clinicians need to have a working knowledge of the best evidence-based approaches to combat its adoption or continued use by this vulnerable population. They should also be armed with the best tactics to help those using stop.

TABLE 2 Major tobacco corporate owners/partners, vaping/ecigs products

Vape/eCig trade name	Corporate partner
Vuse®	RJ Reynolds Vapor Company
Vype®	British American Tobacco
Juul®	Altria (largest stakeholder)
Blu®	Imperial Brands

Note: References: Cantrell, Emelle, Ganz, Hair, and Vallone (2016); Dewhirst (2019); Maloney (2019); Levy et al. (2019).

4.1 | Evidence-based public health outreach and cessation strategies

In order to stop the use of ENDS among LGBTQ individuals and encourage those who are already using these products to quit, interventions must be specifically focused to this population. Prominent etiologic forces identified in this review that contribute to ENDS use in LGBTQ persons include harassment/discrimination in LGBTQ youth and binge drinking in LGBTQ adults. Thus, public health outreach and cessation strategies need to concentrate on mechanisms to decrease harassment/discrimination in LGBTQ youth and reduce binge drinking in LGBTQ persons.

4.1.1 | Harassment/discrimination in LGBTQ youth

LGBTQ youth are at significant risk for bullying, harassment, physical violence, and discrimination based on their sexual orientation and/or gender identity; and the effects of these have been shown to lead to their use of ENDS (Azagba et al., 2019; Berlan et al., 2010; Hinds, Loukas, & Perry, 2018; Marx & Kettrey, 2016; Schneider et al., 2012). This has prompted the National School Nurses Association (National Association of School Nurses, 2016) to adopt a position statement regarding the role of the school nurse in caring for LGBTQ students. In summary, that organization's statement asserts:

All students—regardless of their sexual orientation, gender identity, or gender expression—are entitled to

a safe, supportive, and inclusive school environment with equal opportunities for achievement and participation. It is the position of the National Association of School Nurses (NASN) that the registered professional school nurse is a vital member of the team that supports students' health and well-being and to advocate for policies and practices in the schools that provide for the physical psychological and social safety of all students.

(National Association of School Nurses, 2016, para. 1)

While a comprehensive discussion of the evidence-based strategies to reduce harassment/discrimination in LGBTQ youth is beyond the scope of this work, there are some vital interventions nurses and other public health practitioners can implement that may be efficacious in reducing the incidence of harassment/discrimination of LGBTQ youth. An abundance of evidence suggests the creation of welcoming and safe environments is vital to encouraging acceptance of LGBTQ youth (United States Department of Health & Human Services, 2019). Gay-straight student alliances, sometimes referred to as gender-sexualities alliances (GSAs), affords one avenue in which LGBTQ students and their peer and faculty allies can provide a safe space for LGBTQ persons (Gay Sexualities Alliance (Gender sexualities alliance network (gsanetwork), 2019); United States Department of Health & Human Services, 2019). GSAs provide support, build community, and take action to create change (Gender sexualities alliance network (gsanetwork), 2019). As described by Duncan (2011):

Gay-straight alliances (GSAs) and similar student-initiated groups addressing LGBT issues can play an important role in promoting safer schools and creating more welcoming learning environments. Nationwide, students are forming these groups in part to combat bullying and harassment of LGBT students and to promote understanding and respect in the school community. Although the efforts of these groups focus primarily on the needs of LGBT students, students who have LGBT family members and friends, and students who are perceived to be LGBT, messages of respect, tolerance, and inclusion benefit all our students. By encouraging dialogue and providing supportive resources, these groups can help make schools safe and affirming environments for everyone (para. 2).

GSAs can provide an environment in which LGBTQ youth can openly identify and discuss health issues that disproportionately affect them, which include increased risk for substance abuse and use of ENDS. School nurses can participate in these groups by serving as a sponsor; and public health officials can advocate for their support within schools. In addition, the Equal Access Law enacted through the U.S. Congress (United States Department of Education, 2011) mandates schools with other "non-curricular" clubs or groups allow

GSAs to form (United States Department of Health & Human Services, 2019).

4.1.2 | Reducing binge drinking in LGBTQ adults and other resources

An identified risk factor for ENDS usage in LGBTQ adults is binge drinking (Fallin-Bennett, Lisha, & Lung, 2017). This may at least be partly due to the assimilation of both smoking and drinking behaviors in LGBTQ culture (Fallin-Bennet et al., 2017; Murray, 2019; Youatt, Johns, Pingel, Soler, & Bauermeister, 2015). Bars have historically served as primary social outlets for LGBTQ individuals (Murray, 2019). The birth of the modern LGBTQ civil rights movement is even credited as being sparked as a consequence of oppressive and violent behavior shown towards LGBTQ patrons in the Stonewall Inn, a gay bar in New York's Greenwich Village (Murray, 2019). The ensuing riots began on June 28, 1969 and ended on July 1, 1969. Thus, drinking behaviors coupled with smoking behaviors in bars are often perceived as normative for LGBTQ individuals; and data suggest this normative perception is extending beyond traditional cigarette smoking to use of ENDS (Fallin-Bennet et al., 2017; Youatt et al., 2015).

While the Community Preventative Services Task Force recommends several evidence-based methods to prevent binge drinking and its associated adverse outcomes (see CDC, 2018b), there are data suggesting interventions focusing specifically on LGBTQ persons are more effective in addressing alcohol abuse in this population. Many treatment interventions are tailored specifically to meet the unique needs of LGBTQ persons (Murray, 2019). Just as treatment of alcohol abuse in LGBTQ persons has evolved into LGBTQ-culturally sensitive approaches, a few public health interventions aimed at stopping smoking culture in bars serving the LGBTQ community have shown promise (Fallin-Bennet et al., 2017).

For example, the Just for Us LGBT Tobacco Prevention Project has focused on divulging and curtailing aggressive and deceptive LGBTQ-marketing tactics employed by the tobacco industry. This group has exposed tobacco industry-sponsored distribution of free e-cigarettes in gay bars in San Jose, California (Fallin-Bennet et al., 2017) and have made education and outreach their priority. The group successfully partnered with public health and LGBTQ community organizations to provide education about the link between promotion of tobacco products in LGBTQ bars and smoking in their "Butt out of our Bars" campaign (Fallin-Bennet et al., 2017). This work culminated in the successful passing of a city ordinance banning distribution of free/low-cost tobacco products in bars (Fallin-Bennet et al., 2017; Queer Pink Lungs, 2019).

The community link on the Just for Us LGBT Tobacco Prevention Project Facebook page (2019) uncovers several examples of messaging used by tobacco companies to market smoking products to the LGBTQ community and provides an interactive forum for users to discuss and educate one another about these schemes (Just for Us LGBT Tobacco Prevention Project, 2019). There are

other public health oriented online resources public health nurses and clinicians can utilize to help reduce smoking in LGBTQ persons and educate this community about smoking and the link between smoking and drinking as well. For example, Queer Pink Lungs (2019) provides a blog that allows users to discuss smoking issues in the LGBTQ community (including a section on the “Butt out of our Bars” Campaign).

The Just for Us LGBT Tobacco Prevention Project also has a Twitter account (2019) that provides users with up-to-date information about the group's progress, education about the tobacco industry's LGBTQ-aimed promotion mechanisms, and a multitude of educational resources and links to help educate LGBTQ persons about smoking, including the use of ENDS.

Other assets available to public health providers include resources provided by the Office of Disease Prevention and Health Promotion (ODPHP, 2020). ODHP's comprehensive database of evidence-based information and recommendations related to tobacco abuse is easily accessible online. It contains a substantive number of resources that link users to the most up-to-date information on evidence related to tobacco use, ranging from tobacco package design for reducing tobacco use to cessation of ENDS use in adults, including pregnant women.

Public health providers should use these online assets to educate their LGBTQ clients and support the efforts of groups that advocate for smoking cessation and prevention in LGBTQ persons. Public health nurses and other public health clinicians should also support allocation of dollars for these types of innovative outreach methods as well.

5 | SUMMARY AND CONCLUSIONS

As illustrated in this work, smoking and rates of tobacco abuse, including use of ENDS, remain higher in LGBTQ persons. While literature supports this, there has been very little scholarly inquiry about the emerging trend of use of ENDS in LGBTQ populations. Nonetheless, because data show a relationship between harassment/ discrimination and ENDS use in LGBTQ adolescents and binge drinking and ENDS use in adults, public health nurses, physicians, and public health advocates should work to reduce these causative factors. Examples provided included promotion and support of GSAs and combatting the deceptive and destructive marketing techniques employed by tobacco companies aimed at the LGBTQ community, particularly in LGBTQ bars. Future research needs to assess the long-term physiologic effects of ENDS on cardiopulmonary health and cancer, identify emerging trends in smoking and use of ENDS in LGBTQ persons, and should measure the effectiveness of evidence-based methods of ENDS cessation and prevention to inform the public's health and provide clinicians with strategies to help reduce this disparity in the LGBTQ community.

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