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Combustible Cigarette Smoking and Alternative Tobacco Use in a Sample of Youth Transitioning from Foster Care

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Abstract

Among the struggles faced by youth currently in or recently exiting foster care, tobacco use remains a low priority for practitioners and researchers, alike. Indeed, despite the dramatically altered landscape of tobacco products on the market, there have been no studies evaluating the use of alternative tobacco products among this vulnerable population. The current study aimed to determine the prevalence of lifetime and current combustible and non-combustible tobacco use among youth exiting foster care, and report on the prevalence of nicotine dependence, motivation to quit, and preferred methods of tobacco cessation. Youth aged 18-24 ($M = 20.13$, $SD = 1.16$) who were transitioning from foster care ($N = 154$) completed a survey of tobacco product use adapted from the Population Assessment of Tobacco and Health Baseline Survey. Most participants (76%) reported lifetime use of combustible cigarettes, while almost half (42%) were current combustible cigarette smokers. Current use of electronic cigarettes was comparable to general population rates. Many participants (76%) reported interest in quitting and willingness to try through patches/gum (56%) and technology-based (61%) approaches. Youth exiting foster care are at high risk for smoking and other tobacco product use, as well as dependence, yet are rarely screened for use or advised to quit. As tobacco use remains among the most preventable causes of mortality and morbidity, future work should involve implementation of screening within child welfare and tailoring interventions to the unique needs of this population. The current results underscore a missed opportunity to promote public health in a vulnerable population.

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Declarations of interest
None

Keywords

Foster Care; Tobacco Use; Alternative Tobacco; e-cigarettes; Disparities

1. Introduction

Cigarette smoking remains the most preventable cause of disease and death in the United States, as it accounts for more than 480,000 annual deaths and over 16 million Americans who suffer with a smoking-related disease (U.S. Department of Health and Human Services, 2014). Recently, however, combustible cigarette use has declined across the population (Centers for Disease Control and Prevention, 2018) and particularly among youth and young adults (Center for Behavioral Health Statistics and Quality, 2016; Miech et al., 2017). While these decreases are certainly welcome, they have been offset by substantial increases in the use of alternative tobacco products including combustible products such as small cigars, cigarillos and hookah, and non-combustible products, most notably, electronic nicotine delivery devices (ENDS, or electronic cigarettes [“e-cigarettes”]). Indeed, e-cigarette use surpassed combustible cigarette use among youth and young adults for the first time in 2014 national data (Arrazola et al., 2015), a trend that has continued to the present, making e-cigarette prevalence rates lag only behind marijuana and alcohol (Miech et al., 2017). Moreover, a cumulative body of work is beginning to show strong evidence that use of e-cigarettes is related to the initiation of combustible cigarettes (National Academies of Sciences, 2018), even prompting youth who may not have otherwise begun smoking (Barrington-Trimis et al., 2016).

Many vulnerable and underserved groups have not fully shared in the recent national decline in combustible cigarette use. Homeless youth (Tucker, Shadel, Golinelli, & Ewing, 2014; Wenzel, Tucker, Golinelli, Green Jr, & Zhou, 2010), sexual minorities (Lee, Griffin, & Melvin, 2009), individuals with mental illness (Schroeder & Morris, 2010), and foster youth (Braciszewski & Colby, 2015) are among those groups facing substantial tobacco-related health disparities. Indeed, among homeless youth – a group that substantially overlaps with youth in foster care (Fowler, Toro, & Miles, 2009)– rates of current cigarette use have ranged from 40% to 70% (Thompson & Hasin, 2011; Wenzel et al., 2010), while use of alternative tobacco products in this population have also exceeded 70% (Tucker et al., 2014), though the latter were lifetime cigarette smokers. Like youth experiencing homelessness, youth in foster care are exposed to a unique set of risk factors (e.g., maltreatment, neglect, substance use in the home, and marital conflict), which have been shown to be predictive of tobacco use above and beyond other well-established tobacco-related risk factors (Ford et al., 2011; Mills, Alati, Strathearn, & Najman, 2014). As such, cigarette smoking among youth in foster care remains extraordinarily high, with lifetime rates ranging from 40% to 62% and current/recent rates from 15% to 46% (Braciszewski & Colby, 2015; Scott Jr, Munson, McMillen, & Ollie, 2006; Shpiegel, Sussman, Sherman, & El Shahawy, 2017; Siegel, Benbenishty, & Astor, 2016; Snyder & Medeiros, 2013; U.S. Department of Health and Human Services, 2005; Zhan, Smith, Warner, North, & Wilhelm, 2016). A national study recently found that youth with a foster care history were twice as likely as their

general population peers to smoke cigarettes and nearly three times as likely to expect they will be smokers as adults (McDonald, Mariscal, Yan, & Brook, 2014).

Although attention to cigarette smoking among youth in foster care is slowly on the rise, only two studies have reported on use of alternative tobacco products, both of which were limited to self-reported rates of smokeless tobacco use (Kim, Buchanan, & Price, 2017; McDonald et al., 2014). As the use of e-cigarettes and other products is increasing, creating risk for progression to and maintenance of more harmful tobacco use patterns such as dual use and multiple tobacco product (MTP) use, investigation of alternative product use among foster youth is imperative. The current study fills a significant gap in the literature by reporting, for the first time, a full range of alternative tobacco product use in a sample of youth who are transitioning out of the foster care system. We also report on the prevalence of nicotine dependence, motivation to quit, and preferred methods of tobacco cessation for youth who have been emancipated from foster care.

2. Method

2.1 Procedures

Young adults were recruited from a New England agency that provides post-foster care transition services. All adult clients at the agency (i.e., 18 years old or older) receiving services between 2016 and 2017 were prospective participants and recruited through non-probability sampling using two different approaches. First, a study research assistant was stationed at the agency for the last three days of each month, when large volumes of agency clients would attend monthly meetings. Agency staff would direct all clients to the research assistant, who invited each client to complete the survey. To reach clients that did not attend monthly meetings, an agency staff member was trained to administer the survey. This staff member would ask each client with whom she had contact at the agency if they were interested in completing the survey. In both approaches, to avoid selection bias, all clients encountered by the research assistant and the staff member were told about the study (i.e., agency staff did not pre-screen or selectively refer clients). Once clients were identified as age-eligible (18 years old), they were given an overview of the study goals and invited to participate. Both approaches also included assurance that participation would not affect their care or service receipt in any way. Those who agreed completed the survey immediately, with all questions read aloud by the surveyor. Surveys took approximately 10-15 minutes and were administered in a private room at the agency. Participants were provided with a \$10 gift card for completing the survey. Study procedures were reviewed and approved by the Pacific Institute for Research and Evaluation Institutional Review Board.

2.2 Participants

Of the 163 age-eligible agency clients whom we approached, 154 (94.5%) participated in the survey. The final sample ($N = 154$) ranged in age from 18 to 24 ($M = 20.13$, $SD = 1.16$) and just over half (52%) were assigned a female sex at birth. With regard to ethnicity and race, over one-quarter (28%) identified as Hispanic/Latino; 34% as non-Hispanic, White; 23% non-Hispanic, Black/African-American; 13% non-Hispanic, more than one race; and 2% other. Participants were an average of 1.28 years removed from foster care ($SD = 0.98$; range

= 0.00 – 4.80); over three-quarters (77%) of youth had been in foster care within the prior two years.

2.3 Measures

Our survey was broken up into several distinct sections and was adapted from the Population Assessment of Tobacco and Health (PATH) Baseline Survey (Hyland et al., 2016). First, we asked all participants about lifetime use, current (i.e., past 30-day) use, and age at first use of combustible cigarettes, electronic cigarettes, cigars/small cigars/cigarillos, pipe tobacco, hookah, smokeless tobacco, dissolvable tobacco, and bidis/kreteks. Additional questions for all participants included tobacco product use by others in the home environment, and past 30-day risky smoking practices including sharing cigarettes (“You and a friend smoked the same cigarette”), smoking while blocking the cigarette’s vents, smoking discarded cigarettes, and “sniping” (i.e., collecting used cigarette butts and either smoking them or using the contents to make a “new” cigarette) (Tucker, Shadel, Golinelli, Ewing, et al., 2015). Participants endorsing past 30-day cigarette use were also asked about average cigarettes smoked per smoking day. Those endorsing past 30-day use of any tobacco product were asked about: 1) the average time to first use of tobacco in the morning as an index of nicotine dependence (Baker et al., 2007); 2) motivation to quit (response options were “no,” “yes, within the next 30 days,” “yes, within the next 6 months,” “yes, within the year,” and “yes, but not within the year”; and 3) whether they had attempted to quit using tobacco (i.e., cessation of all tobacco product use) in the past year, length of most recent quit attempt, past year advice to quit by a health professional (yes/no), and willingness to try seven different methods of quitting. We calculated descriptive univariate statistics for all data. Surveys were interviewer-administered and although participants were informed during the consent process that they could skip questions without penalty, there were no missing data.

3. Results

Lifetime cigarette smoking was common (76%), as was current (42%) and daily (26%) smoking. Among all cigarette smokers, most (58%) smoked 5 or fewer cigarettes per day, fewer (38%) smoked between 6 and 20 cigarettes per day, and only 3 (5%) smoked more than one pack per day. Among daily cigarette smokers, 70% smoked 10 cigarettes per day or fewer. Lifetime use of e-cigarettes, cigar products, and hookah was reported by 50% of participants or more; history of smoking pipe tobacco and using snus were less common (see Table 1). Among lifetime users, we calculated an index of use persistence for each tobacco product as the percentage of lifetime users who remain current users. According to this index, cigarettes were associated with the most persistent use (54%), followed by cigar products (30%), hookah and e-cigarettes (both 26%), pipe tobacco (20%), and snus (12%).

Over one-quarter (27%) of participants reported past 30-day multiple tobacco product (MTP) use. There were 13 combinations of tobacco products used among the 42 MTP users (see Figure 1), with the most common being combustible cigarettes plus cigar products (19%) and combustible cigarettes plus hookah (19%); only slightly less common was cigarettes plus e-cigarettes (17%). Other combinations of note were cigarettes plus e-cigarettes plus cigars (10%) and cigars plus hookah (10%).

Comparing our findings to recent data from 18-24 year olds in the PATH study (Kasza et al., 2017; see Table 2 for a full comparison), our sample was substantially more likely than their same-age peers in the general population to be lifetime cigarette smokers, past 30-day smokers, and daily smokers (26% vs. 15%). We also found higher lifetime use rates of e-cigarettes, cigar products, and hookah among our sample, while PATH young adult participants reported higher lifetime pipe use and similar rates of lifetime snus use. Current (past 30-day use) of alternative products is more similar across the two samples for most non-cigarette products (Table 2). For example, e-cigarette use among PATH respondents mirrors the current sample, as does current use of cigars, pipe, and snus. Notably, current hookah use is more pronounced among the current sample compared to the PATH sample, and whereas multiple product use in the PATH sample most commonly involves cigarettes and e-cigarettes (23%), our participants are more likely to combine cigarettes with other combustible products such as cigars or hookah (Figure 1).

With regard to tobacco use by others in the home, 42% reported currently living with a combustible cigarette smoker. Living with an alternative tobacco product user was less prevalent; 9% of participants indicated living with an e-cigarette user, 8% with a cigar smoker, 1% with a snus user, and 6% with someone using another tobacco product. Regarding risky smoking practices, sharing cigarettes was common (78%), but participants were relatively less likely to smoke while blocking the cigarette's vent (5%), use the contents of discarded cigarettes to remake a cigarette (9%), or smoke a discarded cigarette (3%).

Early morning tobacco use was common, as 58% of current users consumed their first tobacco product within an hour of waking. In terms of quit attempts, 31% were thinking of quitting tobacco use within the next month, yet the most recent tobacco quit attempt involving cessation of all tobacco products lasted a week or less for 44% of current tobacco users. Only 25% of current tobacco users had been advised to quit by a health care practitioner within the past year. Patches/gum (56%), text messaging (49%), and using a computer/internet-based program (37%) were the most frequently endorsed methods of getting help that participants were willing to try. These were followed by one-on-one counseling (31%), calling a quit line (24%), medications such as Zyban and Chantix (20%), and group counseling (17%).

4. Discussion

This is the first study, to our knowledge, to document a full range of alternative tobacco product use among young people transitioning out of foster care. Surveillance of tobacco use among this population is critical as rates and patterns of use may be distinct from those observed in the general population; information on the current use of tobacco products is essential for determining tobacco-related health risk and related treatment needs in this vulnerable population. Overall, we found tobacco use in this sample of young people exiting foster care to be common, and in particular, concentrated in the use of the most harmful (i.e., combustible) forms of tobacco products. Rates of combustible product use in our sample were found to be dramatically higher than among U.S. young adults generally, reflected in both single and multiple product use.

With regard to “sniping” and other risky smoking practices, the rates in our sample are substantially lower than have been reported in other populations. For example, among homeless youth, nearly all 292 survey respondents had engaged in one of the risky smoking behaviors we measured and most (73%) had smoked a discarded cigarette (Tucker, Shadel, Golinelli, Mullins, & Ewing, 2015). Rates of sniping were also much higher (32%) than our sample among general population adults enrolling in a smoking cessation trial (Lantini et al., 2018). Despite the low prevalence discovered among our participants, these risky smoking behaviors remain a concern, given the significant harms associated with sniping (e.g., exposure to toxins and/or susceptibility to infectious diseases such as tuberculosis, influenza, hepatitis, and herpes).

It is encouraging, however, that many of these young adults are interested in quitting tobacco and are willing to try. Indeed, many participants indicated to our interviewer that they were using e-cigarettes with the hope of quitting combustible cigarettes, consistent with studies with other groups of young people (Camenga, Kong, Cavallo, & Krishnan-Sarin, 2016; Dutra & Glantz, 2014; Kong, Morean, Cavallo, Camenga, & Krishnan-Sarin, 2014). Although participants endorsed nicotine replacement therapy as an option, they preferred technology-based approaches over traditional one-on-one counseling, with over 60% of participants expressing interest in either computer- or text message-based interventions. Indeed, previous work has indicated that youth and young adults exiting foster care may prefer technology-based interventions over individual counseling, given a number of population-specific barriers to in-person approaches. Specifically, this population has reported perceived and actual lack of confidentiality with regard to substance use, reluctance to bond with a provider/counselor given experiences with previous close relationships, general mistrust of institutions, and significant judgment and lack of help by case managers and others for engaging in unhealthy behaviors (Braciszewski, Tran, et al., 2018; Davis, 2003), all of which can decrease the likelihood of seeking health care in its traditional forms or provide disincentive for honest reporting about unhealthy behaviors. Others have noted their need for interventions that are mobile, given housing instability and subsequent difficulties coordinating care (Braciszewski & Havlicek, 2018; Horwitz, Owens, & Simms, 2000; Simms, Dubowitz, & Szilagyi, 2000). As such, our group is currently piloting a technology-based smoking cessation model with this population, based on previous successful work with reducing marijuana use among youth exiting foster care (Braciszewski et al., 2016; Braciszewski, Tzilos Wernette, et al., 2018).

Given that our participants have high rates of harmful MTP use and high willingness to quit or cut down, the low rates of advice from health practitioners represents a significant missed opportunity for health promotion. Health care providers are increasingly having conversations with patients about e-cigarette use (Brown-Johnson et al., 2016; Nickels, Warner, Jenkins, Tilburt, & Hays, 2016; Young-Wolff et al., 2017), though the extent to which physicians and others are knowledgeable about the relative harms and benefits associated with e-cigarette use appears to be low (El-Shahawy, Brown, & Elston Lafata, 2016). Given reports that foster youth are often skeptical of authority figures and institutions (Braciszewski, Tran, et al., 2018; Davis, 2003), health care professionals may benefit from training on partnering with vulnerable populations, such that a trusting bond is more easily and quickly formed. With e-cigarette use on the rise in the general population of youth and

young adults (Miech et al., 2017), it is also possible that less attention is being paid to the screening of other combustible products (e.g., hookah, cigars). Health care systems and clinics could leverage technology-based screening of all tobacco products, linked to the electronic health record (EHR). Patients could complete validated, comprehensive screening instruments in the waiting room, which then produce flags in the EHR once the patient reaches the exam room. Coverage for smoking cessation under the Affordable Care Act and through Medicaid services (McAfee, Babb, McNabb, & Fiore, 2015) and trends toward FDA approval of technology-based interventions (United States Food and Drug Administration, 2017) offer promising opportunities to significantly impact cessation rates among this population.

A significant portion of youth in and exiting from foster care, however, do not often receive care in ambulatory settings, but rather through acute care services (Rubin, Alessandrini, Feudtner, Localio, & Hadley, 2004). The gap between health service need and availability, moreover, continues to widen over time (Casanueva, Stambaugh, Urato, Fraser, & Williams, 2011; McCarthy, Van Buren, & Irvine, 2007), as youth transition out of care and into an adult system with which they are not familiar. Emancipation from foster care is also highly associated with experiencing homelessness (Fowler et al., 2009), which, in turn, predicts being uninsured and having unmet health care needs (Kushel, Yen, Gee, & Courtney, 2007). Thus, while the Affordable Care Act may offer a safety net for a subset vulnerable population (youth are required to have been in foster care at age 18 and enrolled in Medicaid at the time), accessing health care may remain a challenge. Therefore, for this segment of young people who could substantially gain from early intervention, it is paramount that child welfare and foster care agencies implement comprehensive tobacco screening services into their intake and annual assessments. Understandably, child welfare agencies focus primarily on safety and security, doing all they can to prevent future abuse and neglect. Given the myriad health-related concerns in this population and their inflated risk for poor outcomes in young adulthood (Courtney & Dworsky, 2006; Pecora et al., 2006), it is possible that tobacco use is perceived as being of lower priority. Cigarette smoking however, continues to be the leading preventable cause of death in the United States (U.S. Department of Health and Human Services, 2014) and also causes both stroke and coronary heart disease, which rank among the top five causes of death for U.S. citizens 15 and older (Centers for Disease Control and Prevention, 2017). Thus, child welfare agencies could also benefit from electronic screening of all tobacco products among youth in care, such that prevention and cessation interventions can be implemented before nicotine dependence is established. Additional workshops and trainings should also be offered to educate child welfare stakeholders on the harms of tobacco use and equip them with the proper tools to effectively aid their constituents.

4.1 Limitations

Although this paper presents new data on alternative tobacco use among young adults receiving post-foster care transitional services, some limitations should be acknowledged. First, the study sample was one of convenience and may not be representative of all people who have exited foster care. The partner agency had enlisted the authors' help in creating and administering a survey that would provide a detailed understanding of the prevalence

and patterns of tobacco product use among their clients, as well as an assessment of their interest in quitting and other treatment-relevant data such as level of dependence. To maximize participation and adherence to the agency's primary interests, we were unable to assess a broader scope of tobacco use predictors including those that may be specific to this population (e.g., mental health problems, maltreatment), which is an important area for future research. In addition, our procedures (i.e., in-person assessment) prevented us from surveying the entire sample of individuals age 18 and over receiving services at this agency. Thus, we are unable to comment on tobacco use among those who do not regularly visit the agency, but rather, receive remote services or have contact with their case manager in the field only. While it would be logical to assume that individuals who do not regularly visit the agency would be at higher risk for unhealthy behaviors, it has been our experience (in eight years of working with this agency and its clients) that there are few differences between those who come into the agency and those who do not come in regularly that may have impacted our findings.

Other limitations include that we did not assess the relationship(s) between participants and the smokers with whom they share a living space (e.g., peers, caregivers). Such information could be important in determining the potential impact on quit attempts, as caregivers may hold power over housing stability that could create different barriers to quitting when compared to peer roommates. Among the members of the sample who did not report living with a tobacco user, we cannot distinguish between those who live alone and those who live only with nontobacco users. Agency data indicate that 50% of this population do live with another person (e.g., with family), while an additional 46% live "independently," which can include others. In sum, a substantial majority of these young people live with others, extending confidence in our estimates of smoking in the home.

While only one in four participants reported health care providers advocating for cessation in the past year, we are uncertain how many participants had a health care visit within that time frame. Low rates of physician advice could be the result of low rates of health care utilization. However, agency data indicate that 69% of their clientele have had a physical examination in the past year, and nearly all (94%) have done so in the last two years. These data suggest that it is probably the case that the majority of these youth who have contact with a health care practitioner are leaving such visits without an essential health issue being addressed.

Finally, all data were based on self-report and biological confirmation of use was not obtained. Whereas under-reporting of use in this context is more likely than over-reporting our tobacco use prevalence estimates are probably conservative (Lantini et al., 2015). Finally, our data only represent young adults aged 18 and older. Understanding tobacco use among younger adolescents in foster care would be an important addition to the literature, as we are not aware of any published data on tobacco use among current foster youth. This information would also greatly assist case managers and other clinical staff in helping young people with cessation efforts. Access to young people in care and asking questions about their health, however, requires the permission of each state's child welfare department, which we were not able to obtain.

4.2 Future Directions

Our findings document the wide variety of tobacco products used by a sample of young adults exiting the foster care system, reflecting the dramatically altered landscape of tobacco products in the U.S. These data, paired with substantial interest in quitting and low rates of endorsing smoking cessation advice from health care practitioners, all point to the need for universal screening of tobacco product use in young adult patients, the provision of advice to quit, and assistance for doing so. It is important for health care practitioners to be aware that recent dramatic declines in smoking prevalence were not experienced in all subpopulations, and that – within certain vulnerable groups – combustible tobacco use remains a significant health risk. Screening tools and interventions in child welfare and health care settings alike should reflect the full range of tobacco products young people use, and practitioners should understand products' relative risks for addiction and disease outcomes. Such knowledge can help reduce tobacco-related health disparities, as seen in this vulnerable population. Resources for health care professionals can be found at www.smt.org and www.treattobacco.net. Future work also involves creating tailored interventions that address the unique needs of this vulnerable population, provision of education about tobacco product harms to health care practitioners and child welfare stakeholders, and training in working with vulnerable populations for health care workers.

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Highlights

- Assessment of tobacco use by youth in foster care is scarce in both child welfare settings and the research literature.
- To date, studies of alternative tobacco product use in this population have been limited in scope.
- We assessed combustible and alternative tobacco use, as well as nicotine dependence and preferred cessation methods.
- Youth exiting foster care are at high risk for tobacco product use, yet are rarely screened for use or advised to quit.
- These results underscore a missed opportunity to promote public health in a vulnerable population.

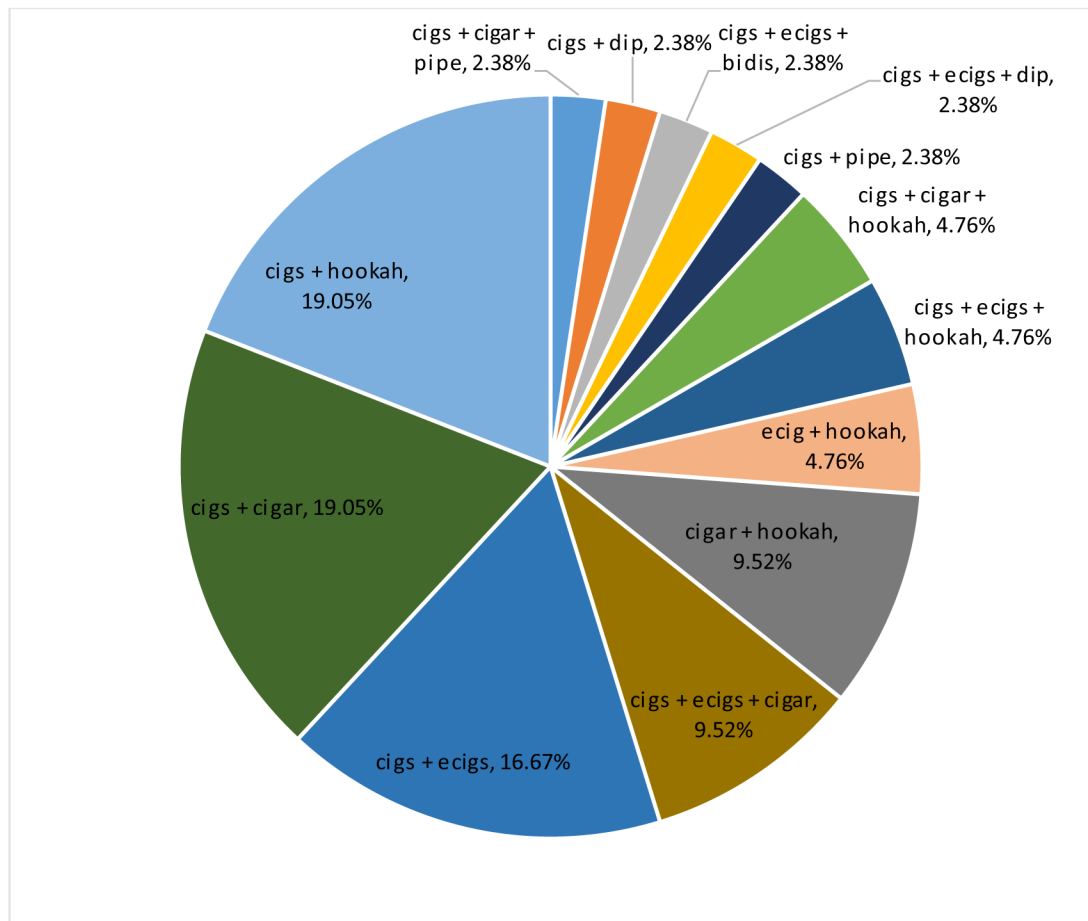


Figure 1.
Proportion of tobacco product combinations among current users.

Table 1.

Prevalence and characteristics of alternative tobacco product use.

Tobacco Product	Ever Use	Age 1st Use	Past 30-Day Use	# Days/Past 30
	<i>n</i> (%)	<i>M</i> (<i>SD</i>)	<i>n</i> (%)	<i>M</i> (<i>SD</i>)
E-cigarettes	82 (53)	17.1 (1.2)	21 (14)	14.4 (13.0)
Cigar, small cigar, cigarillo	81 (53)	15.7 (2.1)	24 (16)	7.3 (10.6)
Hookah	93 (60)	16.9 (1.9)	24 (16)	4.3 (6.3)
Pipe tobacco	10 (6)	15.7 (2.6)	2 (1)	3.5 (2.1)
Snus	17 (11)	15.2 (2.3)	2 (1)	4.0 (4.2)
Combustible cigarettes ^{<i>I</i>}	117 (76)	14.2 (2.5)	64 (42)	12.0 (13.8)

^{*I*}For comparison.

Table 2.

Comparison of alternative tobacco product use with national data.

Tobacco Product	Ever Use (%)		Past 30 Day Use (%)	
	Survey	PATH	Survey	PATH
E-cigs	53	32	14	12
Cigar, cigarillo, etc.	53	44	16	16
Hookah	60	44	16	11
Pipes	6	13	1	2
Snus	11	10	1	2
Combustible cigarettes ^{<i>I</i>}	76	53	42	29

^{*I*}For comparison.