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Very light smoking and alternative tobacco use among college students

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Abstract

Introduction—Concurrent use of cigarettes with alternative tobacco products (ATPs), even among very light smokers, may be harmful. This study examined current use of e-cigarettes, cigars, and hookah, and susceptibility to future use of these products in a sample of college student cigarette smokers.

Methods—Participants were 1161 18–29 year old (M age=21.15; SD=2.72; 52.7% female; 41.2% non-Hispanic white) current, or past 30-day cigarette smokers, drawn from a larger study. Current smokers were categorized as very light smokers [5 cigarettes per day (cpd)] and heavier smokers (>5 cpd).

Results—88.6% of all participating college student smokers were very light smokers and 67.7% used at least one ATP concurrently. The prevalence of current use in this sample was 42.9% for ecigarettes, 36.4% for hookah, and 25.9% for cigars. Compared to heavier smokers, very light smokers were more likely to be younger, racial/ethnic minorities, and four-year versus two-year college students. Multilevel logistic regression models showed that after controlling for sociodemographic characteristics and substance use, being a very light smoker, compared with a heavier smoker, was negatively associated with concurrent e-cigarette use, but positively associated with concurrent cigar use, and not associated with concurrent hookah use. Moreover, compared to heavier smokers, very light smokers reported being more susceptible to future cigar and hookah use, but not e-cigarette use.

DECLARATION OF INTERESTS

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The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH or the FDA. The authors declare no conflicts of interest.

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Conclusions—Concurrent use of cigarettes with ATPs is popular among all college student smokers, but very light smokers are more likely than heavier smokers to use combustible ATPs. Smoking intervention programs and campus policies should caution smokers, especially very light smokers, against ATP use.

INTRODUCTION

While cigarette smoking declined over the past two decades (Jamal et al., 2015), tobacco use among young adults remains a serious public health concern. Very light smoking has become the predominant form of tobacco use among young adults aged 18–29 (Pierce, White, & Messer, 2009). At the same time, use of alternative tobacco products (ATPs), including electronic cigarettes (e-cigarettes), cigars, and hookah have gained popularity among young adults (Richardson, Williams, Rath, Villanti, & Vallone, 2014). Compared to other adult subgroups, young adults not only have a higher prevalence of tobacco use in general, but also are more likely to use cigarettes and ATPs concurrently (Kasza et al., 2017).

Young adulthood is a critical developmental period for initiating and maintaining cigarette smoking (Caldeira et al., 2012), and progressing to regular tobacco use (Rath, Villanti, Abrams, & Vallone, 2012). Very light smoking, defined as smoking five or fewer cigarettes per day (Pierce et al., 2009; Li, Holahan, & Holahan, 2015), often remains stable throughout young adulthood and is associated with adverse health consequences later in life, including cardiovascular and pulmonary diseases (Caldeira et al., 2012). Very light smoking is also associated with equal or higher risk of past month substance use including binge drinking and marijuana use compared to heavier smoking [more than 5 cigarettes per day (cpd); conventionally defined as medium, moderate to heavy smoking] (Li et al., 2015).

Although many ATPs have been marketed as having lower health risks than cigarettes, some products are known to contribute to significant health risks (Akl et al., 2010; Baker, 2000). Similarly, although some research indicates that ATPs facilitate smoking reduction or cessation in the general adult population (Zhu, Zhuang, Wong, Cummins, & Tedeschi, 2017), ATP use by young adult very light smokers is not associated with intentions to reduce or quit smoking (Sutfin, McCoy, Morrell, Hoeppner, & Wolfson, 2013). Concurrent use of cigarettes and ATPs may lead to escalated use of cigarettes and increased risk for nicotine dependence (Doran & Brikmanis, 2016).

College students represent 40% of young adults (Snyder, de Brey, & Dillow, 2016). College students have a lower prevalence of smoking than non-college students, but they are more likely to be very light smokers than heavier smokers (White, Bray, Fleming, & Catalano, 2009). Previous studies have examined associations between cigarette smoking and ATP use among college students (Sutfin et al., 2013). However, few studies have examined if use of ATPs, such as e-cigarettes and hookah, varies across smoking intensity (i.e., very light versus heavier smoking) or if college students' future intentions to use ATPs vary across smoking intensity. The present study extends existing research by examining the associations between smoking intensity and a) current e-cigarette, cigar, and hookah use and

b) susceptibility to use of the aforementioned ATPs by 18–29 year old college student cigarette smokers.

METHODS

Participants

Participants were 1161 current, or past 30-day, cigarette smokers drawn from the baseline wave (November 2014 to February 2015) of the Marketing and Promotions across Colleges in Texas project (Project M-PACT). The study sample had an average age of 21 years old (*SD*=2.72) and about half were female (52.7%). Regarding race/ethnicity, 41.2% of current smokers were non-Hispanic white, 34.6% were Hispanic/Latino, 5.5% were African-American/Black, 10.9% were Asian, and 7.8% reported another race/ethnicity or reported two or more races/ethnicities.

Procedure

Eighteen-to-29 year old students who were enrolled full- or part-time at 24 two- and fouryear colleges in five counties surrounding Austin, Dallas/Fort Worth, Houston, and San Antonio were recruited to participate in Project M-PACT. All participants were compensated with a \$10 e-gift card and entered into a drawing to win one of twenty \$50 e-gift cards. Detailed eligibility and recruiting procedures are reported elsewhere (Loukas et al., 2016).

Measures

Socio-demographic and substance use covariates—Gender, age group (younger = 18–24 years old versus older = 25–29 years old), race/ethnicity (white versus racial/ethnic minority) and college type (two- versus four-year) were included as covariates in the analyses. Current use of marijuana and binge drinking were also included as covariates. Current marijuana use was coded as "1" = smoked marijuana on one or more of the past 30 days or "0" = smoked marijuana on zero of the past 30 days. Past 14-day binge drinking was established by asking "During the past 14 days, on how many days did you have 5 or more drinks of alcohol in a row?" and coded as "1" = reported binge drinking behavior on one or more of the past 14 days.

Current smoking intensity—Students who endorsed smoking at least one cigarette in the past 30 days were asked two questions to assess smoking, one regarding current frequency "on how many of the past 30 days did you smoke cigarettes?" and the other current quantity "on the days you smoked, how many cigarettes did you usually smoke each day?" Based on prior research (Husten, 2009; Pierce et al., 2009), the total monthly number of cigarettes was obtained by multiplying current frequency and current quantity, and the average cigarettes per day (cpd) was computed as total monthly cigarettes divided by 30. Smoking intensity was defined as "1" = very light (5 cpd) and "0" = heavier (> 5cpd), with heavier smokers as the reference group.

Current ATP use—Current (past 30-day) use of ATPs, including e-cigarettes, cigars, and hookah, was assessed with one item for each product. The item was adapted from the Youth Tobacco Survey (Starr et al., 2005) and the Population Assessment of Tobacco and Health

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(PATH) Survey (National Institutes of Health, 2014). For e-cigarettes, we asked "During the past 30 days, have you used any ENDS product, (i.e. an e-cigarette, vape pen, or e-hookah), even one or two puffs, as intended (i.e. with nicotine cartridges and/or e-liquid/e-juice)?" For cigar products and hookah, the question was, "during the past 30 days, how many days did you use/smoke _____ as intended (i.e. with tobacco)"? Each variable was dichotomized into "1" for current-users (used on least one day during last 30 days) and "0" for non-current users.

Susceptibility to ATP use—Susceptibility to ATP use was measured with two items from Pierce et al. (1998) for each ATP. "If one of your friends were to offer you ____, would you smoke/use it?" and "Do you think you will use any of the following in the next 12 months?". Response options for both questions were "definitely not", "probably not", "probably yes", and "definitely yes". Only participants who selected "definitely not" for both questions were considered non-susceptible to future use and coded as "0". All other participants were considered susceptible to future use and coded as "1" (Pierce, 1998).

Data Analysis

Analyses were conducted in R 3.3.2. Separate multilevel logistic regression models were used to examine the associations between cigarette smoking intensity, the independent variable, and each of the six current ATP use and susceptibility to ATP use dependent variables. Gender, age, race/ethnicity, type of college (two- versus four-year institution), and substance use covariates were included in the models. Multilevel models were conducted to include school as a random intercept.

RESULTS

The majority of participating current smoking college students (88.6%) reported very light smoking (5 cpd). On average, participants smoked about 11 days out of the past 30 days and about 2 cpd. Only 14.3% of the sample were daily smokers. Very light smokers were more likely than heavier smokers to be younger (aged 18–24 versus 25–29), racial/ethnic minorities (versus non-Hispanic White), and to attend a 4-year (versus 2-year) institution, but they did not differ in gender or marijuana use and binge drinking. The majority (67.7%) of college student smokers used at least one ATP concurrently. The most popular product concurrently used with traditional cigarettes was e-cigarettes (42.9%), followed by hookah (36.4%), and then cigars (25.9%). A large portion of student current smokers was susceptible to future ATP use (see Table 1).

The multilevel logistic regression models (see Table 2) indicated that even after controlling for all covariates, smoking intensity was associated with both current e-cigarette use and current cigar use, but not current hookah use. Compared with heavier smokers, very light smokers had greater odds of using cigars concurrently while they had lower odds of using e-cigarettes concurrently. Additional multilevel logistic regression analyses indicated that compared with heavier smokers, very light smokers had greater odds of being susceptible to future cigar and hookah use, but not e-cigarette use (see Table 2).

DISCUSSION

Consistent with previous studies, the findings indicated that a majority of college student smokers consumed no more than five cigarettes per day (Husten, 2009; Pierce et al., 2009), and most used at least one type of ATP concurrently (Richardson, Williams, et al., 2014). The prevalence of e-cigarette use is particularly notable at over 40% among both very light and heavier smokers. The concurrent use of cigarettes and e-cigarettes could reinforce dependence on nicotine (Fix et al., 2014) and requires further investigation. Extending existing research, findings indicated that very light cigarette smokers varied from heavier smokers in their concurrent use of ATPs. Whereas very light smoking college students were more likely than their heavier smoking peers to use cigars, they were less likely to use ecigarettes. These findings corroborate research with adult smokers, indicating that compared with daily smokers, non-daily smokers (who consume fewer cigarettes than daily smokers) are more likely to use combustible ATPs (Dunbar, Shadel, Tucker, & Edelen, 2016) and less likely to use non-combustible ATPs (Richardson, Pearson, Xiao, Stalgaitis, & Vallone, 2014). Very light smokers may be at lower risk for tobacco related diseases than heavier smokers, but concurrent use of ATPs, particularly combustible ones, may increase their risk for negative health outcomes (Doran & Brikmanis, 2016) and subsequent nicotine dependence (Dunbar et al., 2016).

Motives to use might play a role in differentiating concurrent ATP use among very light versus heavier smokers. Compared with very light smokers, heavier smokers are more likely to endorse using ATPs in order to cut down on cigarettes or to quit (Dunbar et al., 2016). Alternatively, smokers with lower cigarette consumption are more likely to use ATPs for improving affect or for socialization purposes (Doran & Brikmanis, 2016). Since most college student tobacco users are also very light smokers, they may not be motivated to quit or cut down on smoking (Sutfin et al., 2013). Given limited research, additional studies examining motives for concurrent use of various ATPs among very light and heavier cigarette smoking college students are warranted.

More than three quarters of all college student smokers were susceptible to future use of at least one ATP. Although there was no difference between the two groups in concurrent hookah use, very light smokers were more likely than heavier smokers to be susceptible to using hookah in the future. Interestingly, there were no differences between the two groups in susceptibility to e-cigarette use, which indicates that very light smokers are as likely as heavier smokers to try e-cigarettes in the future, also potentially increasing their risk for subsequent nicotine addiction from these products (Richardson, Pearson, et al., 2014).

Study findings should be interpreted within the context of certain limitations. This is a crosssectional study of college student smokers from the four largest metropolitan areas in Texas. Longitudinal studies with young adult college students outside of Texas and/or non-college attending young adults are needed to determine the role of smoking intensity on progression of ATP use and to generalize findings to the young adult population. Moreover, although our definition of smoking intensity considers both quantity and frequency of cigarette use, it does not consider variations in daily cigarette use, given that only 14.3% of the sample were daily smokers. The low proportion of daily smokers in our sample may be indicative of the

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increasing prevalence of intermittent/non-daily smoking in the general population (Jamal et al., 2015), but also limits nuanced examination of ATP use by quantity, frequency, and daily cigarette use.

Notwithstanding the above limitations, the current study extends existing research by indicating that very light smokers are more vulnerable than heavier smokers to concurrent cigar use and more susceptible to using both hookah and cigars. Although very light smokers were less likely than their peers to concurrently use e-cigarettes, there were no differences between the two groups in susceptibility to future use of this product. Findings highlight the need to develop effective interventions to educate college students, particularly very light smokers, about the harms associated with ATPs (Dunbar et al., 2016). Findings also indicate the need to define subcategories of tobacco users based on use motives and consumption level of both cigarettes and ATPs.

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References

- Akl EA, Gaddam S, Gunukula SK, Honeine R, Jaoude PA, Irani J. The effects of waterpipe tobacco smoking on health outcomes: a systematic review. International Journal of Epidemiology. 2010; 39(3):834–857. https://doi.org/10.1093/ije/dyq002. [PubMed: 20207606]
- Baker F. Health Risks Associated With Cigar Smoking. JAMA. 2000; 284(6):735. https://doi.org/ 10.1001/jama.284.6.735. [PubMed: 10927783]
- Caldeira KM, O'Grady KE, Garnier-Dykstra LM, Vincent KB, Pickworth WB, Arria AM. Cigarette smoking among college students: longitudinal trajectories and health outcomes. Nicotine & Tobacco Research. 2012; 14(7):777–85. https://doi.org/10.1093/ntr/nts131. [PubMed: 22589418]
- Doran N, Brikmanis K. Expectancies for and use of e-cigarettes and hookah among young adult nondaily smokers. Addictive Behaviors. 2016; 60:154–159. https://doi.org/10.1016/j.addbeh. 2016.04.008. [PubMed: 27155241]
- Dunbar MS, Shadel WG, Tucker JS, Edelen MO. Use of and reasons for using multiple other tobacco products in daily and nondaily smokers: Associations with cigarette consumption and nicotine dependence. Drug and Alcohol Dependence. 2016; 168:156–163. https://doi.org/10.1016/ j.drugalcdep.2016.09.005. [PubMed: 27664553]
- Fix BV, O'Connor RJ, Vogl L, Smith D, Bansal-Travers M, Conway KP, ... Hyland A. Patterns and correlates of polytobacco use in the United States over a decade: NSDUH 2002–2011. Addictive Behaviors. 2014; 39(4):768–781. https://doi.org/10.1016/j.addbeh.2013.12.015. [PubMed: 24457900]
- Husten CG. How should we define light or intermittent smoking? Does it matter? Nicotine & Tobacco Research. 2009; 11(2):111–21. https://doi.org/10.1093/ntr/ntp010. [PubMed: 19246425]
- Jamal A, Homa DM, O'Connor E, Babb SD, Caraballo RS, Singh T, ... King BA. Current cigarette smoking among adults—United States, 2005–2014. Morbidity and Mortality Weekly Report. 2015; 64(44):1233–1240. [PubMed: 26562061]
- Kasza KA, Ambrose BK, Conway KP, Borek N, Taylor K, Goniewicz ML, ... Hyland AJ. Tobacco-Product Use by Adults and Youths in the United States in 2013 and 2014. New England Journal of Medicine. 2017; 376(4):342–353. https://doi.org/10.1056/NEJMsa1607538. [PubMed: 28121512]

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- Li, X., Holahan, CK., Holahan, CJ. Sociodemographic and Psychological Characteristics of Very Light Smoking Among Women in Emerging Adulthood, National Survey of Drug Use and Health, 2011; Preventing Chronic Disease. 2015. p. 12https://doi.org/10.5888/pcd12.140547
- Loukas A, Chow S, Pasch KE, Li X, Hinds JT III, Marti CN, ... Perry CL. College Students' Polytobacco Use, Cigarette Cessation, and Dependence. American Journal of Health Behavior. 2016; 40(4):514–522. https://doi.org/10.5993/AJHB.40.4.13. [PubMed: 27338998]

National Institutes of Health. Population assessment of tobacco and health (PATH) study. 2014

Pierce JP. Tobacco Industry Promotion of Cigarettes and Adolescent Smoking. JAMA. 1998; 279(7): 511. https://doi.org/10.1001/jama.279.7.511. [PubMed: 9480360]

- Pierce JP, White MM, Messer K. Changing age-specific patterns of cigarette consumption in the United States, 1992–2002: association with smoke-free homes and state-level tobacco control activity. Nicotine & Tobacco Research. 2009; 11(2):171–7. https://doi.org/10.1093/ntr/ntp014. [PubMed: 19246423]
- Rath JM, Villanti AC, Abrams DB, Vallone DM. Patterns of Tobacco Use and Dual Use in US Young Adults: The Missing Link between Youth Prevention and Adult Cessation. Journal of Environmental and Public Health. 2012; 2012:1–9. https://doi.org/10.1155/2012/679134.
- Richardson A, Pearson J, Xiao H, Stalgaitis C, Vallone D. Prevalence, Harm Perceptions, and Reasons for Using Noncombustible Tobacco Products Among Current and Former Smokers. American Journal of Public Health. 2014; 104(8):1437–1444. https://doi.org/10.2105/AJPH.2013.301804. [PubMed: 24922154]
- Richardson A, Williams V, Rath J, Villanti AC, Vallone D. The Next Generation of Users: Prevalence and Longitudinal Patterns of Tobacco Use Among US Young Adults. American Journal of Public Health. 2014; 104(8):1429–1436. https://doi.org/10.2105/AJPH.2013.301802. [PubMed: 24922152]
- Snyder, T., de, Brey C., Dillow, S. Digest of Education Statistics, 2014. 2016. Retrieved from http:// nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2016006
- Starr, G., Rogers, T., Schooley, M., Porter, S., Wiesen, E., Jamison, N. Key outcome indicators for evaluating comprehensive tobacco control programs. CDC; 2005. Key outcome indicators for evaluating comprehensive tobacco control programs.
- Sutfin EL, McCoy TP, Morrell HE, Hoeppner BB, Wolfson M. Electronic cigarette use by college students. Drug and Alcohol Dependence. 2013; 131(3):214–21. https://doi.org/10.1016/ j.drugalcdep.2013.05.001. [PubMed: 23746429]
- White HR, Bray BC, Fleming CB, Catalano RF. Transitions into and out of light and intermittent smoking during emerging adulthood. Nicotine & Tobacco Research. 2009; 11(2):211–219. https:// doi.org/10.1093/ntr/ntn017. [PubMed: 19246434]
- Zhu, SH., Zhuang, YL., Wong, S., Cummins, SE., Tedeschi, GJ. E-cigarette use and associated changes in population smoking cessation: evidence from US current population surveys; BMJ. 2017. p. j3262https://doi.org/10.1136/bmj.j3262

HIGHTLIGHTS

- Very light smokers are more likely than heavier smokers to use combustible ATPs.
- Although very light smokers are less likely to concurrently use e-cigarettes, there are no differences between the types of smokers in susceptibility to future use of this product.
- Effective interventions that educate college students, particularly very light smokers, about the harms associated with ATPs are needed.

Table 1

Descriptive Data for Very Light (5 cpd¹) and Heavier (>5 cpd) Smokers on Study Variables

| | Overall Sample (<i>N</i> = 1161) % | Very Light Smoker (<i>n</i> = 1029) % | Heavier Smoker $(n = 132)$ | Chi-Square |
|------------------------------|--|--|----------------------------|------------|
| Demographics | | | | |
| Younger (18–24) | 87.0 | 89.9 | 64.4 | 67.23 *** |
| Non-Hispanic White | 41.2 | 38.2 | 64.4 | 33.16 *** |
| Female | 52.7 | 52.6 | 53.0 | 0.10 |
| Four-Year College | 90.9 | 92.1 | 81.1 | 17.27 *** |
| Marijuana & Alcohol Use | | | | |
| Current Marijuana Use | 53.7 | 54.3 | 48.9 | 1.40 |
| Past 14-Day Binge Drinking | 55.2 | 55.9 | 49.6 | 1.84 |
| Current ATP ² Use | | | | |
| E-cigarettes | 42.9 | 41.7 | 52.3 | 5.35 * |
| Cigar | 25.9 | 27.1 | 16.7 | 6.68 ** |
| Hookah | 36.4 | 37.5 | 28.0 | 4.50 * |
| Susceptibility to ATP Use | | | | |
| E-cigarettes | 85.1 | 84.7 | 87.9 | 0.92 |
| Cigar | 76.5 | 77.8 | 66.7 | 8.07 ** |
| Hookah | 88.3 | 89.9 | 76.5 | 20.23 *** |

| * | |
|-------|---|
| p<.05 | • |

** p<. 01.

*** p<.001.

 1 cpd = cigarettes per day

 2 alternative tobacco product

| | Currer | Current ATP Use AOR (95% CI) | 5% <i>CI</i>) | Susceptib | Susceptible to ATP use AOR (95% CI) | (95% <i>CI</i>) |
|------------------------------------|------------------|------------------------------|------------------|-----------------------------------|-------------------------------------|------------------|
| | E-cigarette | Cigar | Hookah | E-cigarette | Cigar | Hookah |
| Covariates | | | | | | |
| Younger (age 18–24) | 0.91 (0.63–1.32) | 1.35 (0.84–2.15) | 1.70 (1.11–2.61) | 1.70 (1.11–2.61) 1.19 (0.73–1.96) | 1.51 (1.01–2.27) | 1.40 (0.85 2.31) |
| Non-Hispanic White | 0.84 (0.65–1.08) | 0.84 (0.63–1.11) | 0.70 (0.54–0.91) | 1.12 (0.79–1.58) | 1.10 (0.81–1.47) | 0.88 (0.60–1.30) |
| Female | 0.98 (0.77–1.24) | 0.50 (0.38–0.65) | 1.07 (0.84–1.37) | 0.94 (0.68–1.31) | 0.36 (0.27–0.49) 0.87 (0.59–1.27) | 0.87 (0.59–1.27) |
| Four-Year College | 1.34 (0.87–2.09) | 0.76 (0.44–1.33) | 1.59 (1.00–2.57) | 0.92 (0.50–1.70) | 1.36 (0.85–2.19) | 1.75 (1.00–3.07) |
| Current Marijuana Use | 1.56 (1.21–2.00) | 1.47 (1.10–1.96) | 1.58 (1.22–2.05) | 1.53 (1.09 2.15) | 2.00 (1.48–2.67) 1.67 (1.13–2.46) | 1.67 (1.13–2.46) |
| Past 14-Day Binge Drinking | 1.37 (1.07–1.77) | 1.26 (0.95–1.68) | 1.42 (1.10–1.84) | 1.03 (0.73–1.45) | 1.37 (1.02–1.84) | 2.50 (1.67–3.75) |
| Cigarette Smoking Intensity | | | | | | |
| Very Light Smoker | 0.59 (0.40–0.88) | 1.89 (1.13–3.16) | 1.19 (0.78–1.83) | 0.76 (0.43–1.36) | 1.52 (1.00–2.36) | 2.13 (1.28–3.53) |

marijuana use, and non-past 14-day binge drinking; Reference group of cigarette smoking intensity is heavier smoker. ATP=altemative tobacco product.

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Table 2